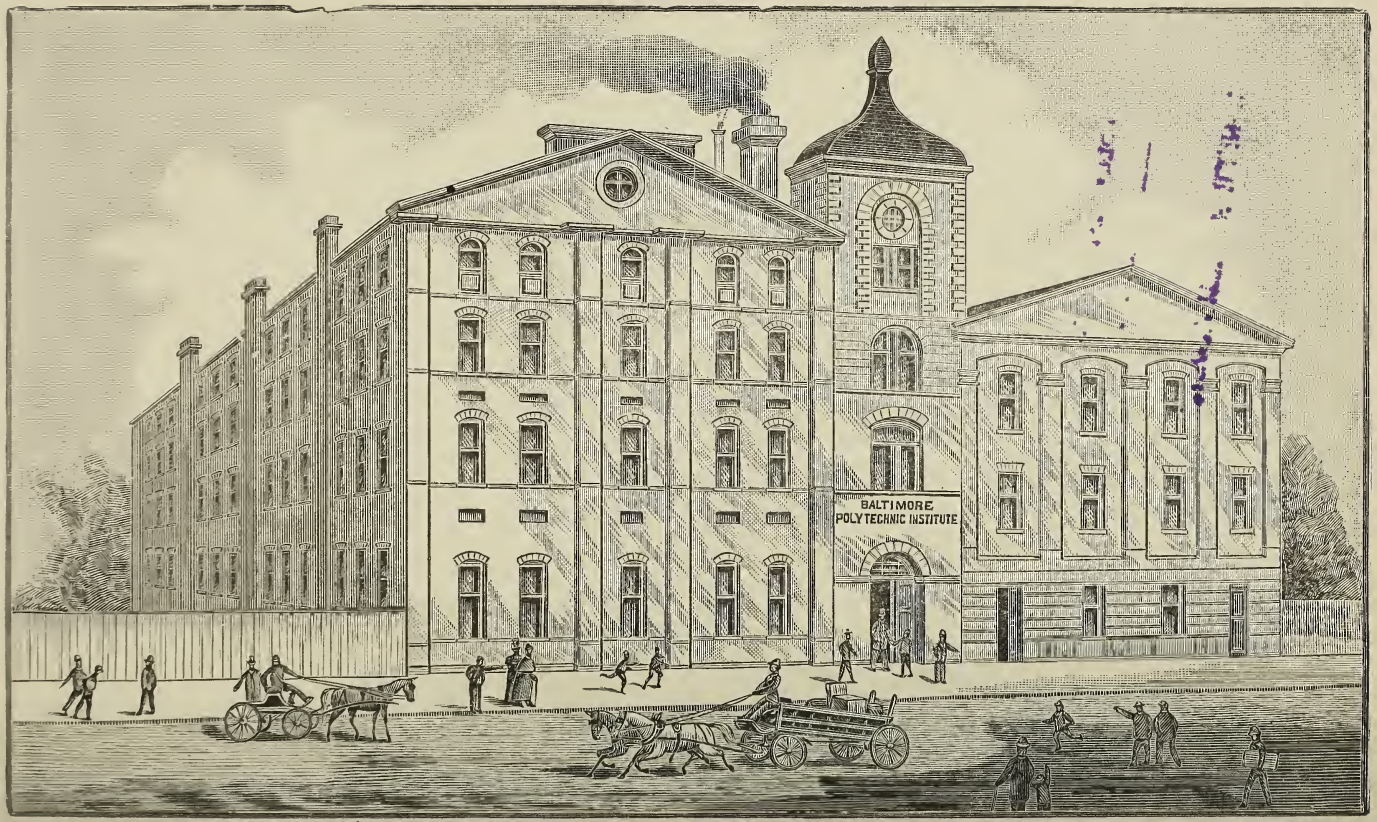
1899

Baltimore Polytechnic Institute Register

311-331 COURTLAND STREET

PRESS OF
J. W. BOND COMPANY
BALTIMORE, MD.

1899.



NEW BUILDING. OLD BUILDING.

Fifteenth Annual Register

— OF THE —

Baltimore Polytechnic Institute,

311 to 331 Courtland Street.

1899.

PRESS OF
J. W. BOND COMPANY,
BALTIMORE, MD.

1899.

CALENDAR 1899.

January 3.	Institute reopens.
February 11.	Third term begins.
February 14.	Classes alternate in the shops.
February 22.	Washington's Birthday.
March 8.	Anniversary of the opening of the Institute.
March 10.	Anniversary of the opening of the Preparatory Department.
March 30.	Holy Thursday.
March 31.	Good Friday.
April 3.	Easter Monday.
April 14.	Arbor Day.
April 28.	Fourth term begins.
May 30.	Decoration Day.
June 12.	Examinations begin.
June 20.	Commencement day.
June 22.	Exhibition day.
June 23.	" "
June 24.	" "
June 30.	Institute closes.
September 1.	First term begins.
September 5.	Institute reopens.
September 12.	Anniversary of the Battle of North Point.
November 21.	Second term begins.
November 25.	Thanksgiving Day.
December 22.	Christmas holiday. Institute closes until January 2, 1900.

COMMITTEE

OF THE

Board of Commissioners of Public Schools

—— ON ——

POLYTECHNIC EDUCATION.

CHARLES H. GATCH, Esq., (*Chairman*).

W. EDWIN PEREGOY, Esq.

MICHAEL SHEEHAN, Esq.

HARRY K. MULLER, Esq.

BENJAMIN HISS, Esq.

JOHN H. HORST, Esq.

PRESIDENT HENRY F. NEW, *ex-officio.*

HONORABLE WILLIAM T. MALSTER, *Mayor, ex-officio.*

FACULTY.

SESSION 1899-1900.

JOHN W. SAVILLE, LL. B., *President*,
Engineering.

RICHARD H. UHRBROCK, Ph. B., *Vice-President*,
Higher Mathematics.

WILLIAM DUGENT,
Instructor in Pattern-making and Wood-turning.

WILLIAM G. RICHARDSON,
Instructor in Machine Construction, Chipping and Filing.

WILLIAM H. HALL,
Instructor in Electricity, Chemistry, Physics and History.

*THOMAS G. FORD,
Instructor in Carving and Carpentry.

JOSEPH F. McBEE,
Instructor in Algebra, Mensuration and Arithmetic.

J. WARD WILSON, M. D.,
Instructor in Anatomy, Physiology and Geography.

*GEORGE M. GAITHER,
Instructor in Carpentry.

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* Graduates of this Institute.

* WARREN S. SEIPP,
Instructor in Free-hand Drawing.

FREDERICK D. J. KAESSMANN,
Instructor in English and German.

WILLIAM A. JONES,
Instructor in Sheet Metal Work.

SAMUEL M. NORTH,
Instructor in English and French.

FREDERICK W. WILD,
Instructor in Sheet Metal Work.

SAMUEL P. PLATT,
Instructor in Mechanical and Architectural Drawing.

* HARRY R. RUSE,
Instructor in Geometry, Algebra and Arithmetic.

* WILLIAM P. GUNDRY,
Instructor in Bookkeeping and Arithmetic.

OLIVER BACHRACH,
Instructor in Grammar, Algebra and Arithmetic.

JOHN H. DEVALIN,
Instructor in Forge Shop.

* JOHN E. BROADBELT, Jr.,
Instructor in Reading, Spelling and Writing.

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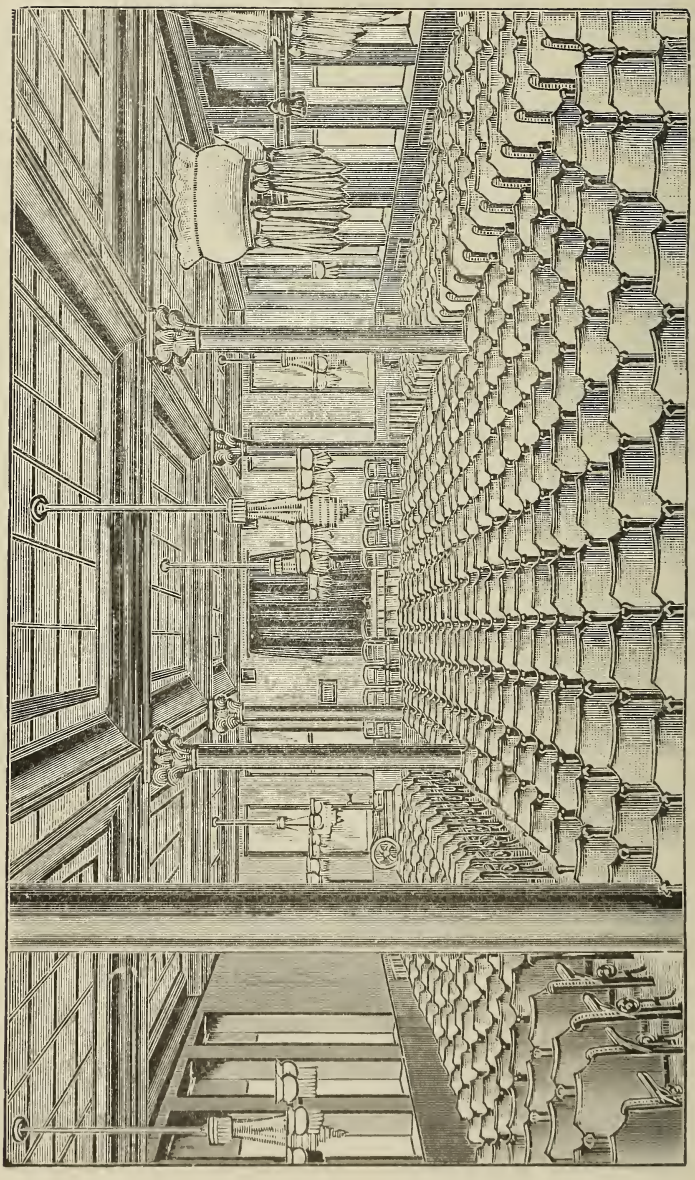
* Graduates of this Institute.



THE ASSEMBLY ROOM.

Names of Students Alphabetically Arranged.

SENIOR CLASS—FIRST SECTION.

Allen, Chas. E.....113 North Carrollton avenue.
Boettinger, Wm. G.....1507 East Madison street.
Brent, Hugh W.....1523 Linden avenue.
Crockett, Charles C.....33 East Henrietta street.
Cushing, Wm. W.....1531 Park avenue.
Focke, Roland S.....1815 St. Paul street.
French, Harry B.....1404 North Gilmor street.
Haferkorn, G. Calvert.....1220 McElderry street.
Knapp, George A.....432 West Conway street.
Lowenthal, Harry.....1905 Linden avenue.
McCeney, George P.....1415 Park avenue.
McCord, Wm. E.....1624 McElderry street.
McCoy, Marion H.....714 North Fulton avenue.
Mencken, Charles E.....1524 Hollins street.
Owens, Charles T.....2020 St. Paul street.
Schaun, Edw. L.....705 North Howard street.
Vincent, Harold B.....Lutherville, Md.
Ward, Joseph A.....929 Argyle avenue.

SENIOR CLASS—SECOND SECTION.

Brent, Harrison.....1523 Linden avenue.
Clayton, Edward Goodnow.....1916 Mt. Royal Terrace.
Cooke, Edward P.....762 Dolphin street.
Davis, Arthur Councilman.....600 Wyanoke avenue.
Demitz, Charles H.....2324 East Baltimore street.
Harper, Robert B.....Upper Marlboro'.
Held, Charles W.....1411 East Lanvale street.
Johnson, Ira.....1620 Eutaw Place.
Lang, Walter B.....1328 Mosher street.
Lucke, Charles C.....513 North Wolfe street.
McCleester, John N.....620 George street.
McDonnell, Blakeley A.....16 Fustin avenue, Catonsville.
O'Conner, Edwin G.....628 Dumbarton avenue.
Phipps, William Taylor.....426 East Eager street.
Sedlacek, Emanuel J.....1530 Ashland avenue.
Sternat, Frederick C. J.....1135 Hamburg street.
Walter, Joseph R.....138 North Broadway.
Whelan, William C.....2029 St. Paul street.

INTERMEDIATE CLASS.

Allbutt, Lawrence G.....1335 North Gilmor street.
Blizard, J. Walter T..... 1924 Garrett avenue.
Buttner, Walter B... ..... 218 Prospect avenue.
Faust, Horace K..... .....224 South Broadway.
Fink, Harry..... ....815 North Broadway.
Groverman, Walter..... ... .Ellicott City.
Harvey, Thomas E.....718 West Dolphin street.
Houck, Roy S.....1331 Argyle avenue.
Johnson, Samuel M.....104 Jackson Square.
Linck, Gustav F ....305 East Fayette street.
Masopust, John C.....900 North Bond street.
Minnick, Charles H.....107 East Lafayette avenue.
Moore, Morgan .....1529 Eutaw Place.
O'Conner, J. Hyde.....628 Dumbarton avenue.
Parsons, Galt F.....1623 North Calvert street.
Wansleben, Thomas O.....706 North Monroe street.
Wright, L. Chase.. ..... 1427 Aisquith street.

JUNIOR CLASS—FIRST SECTION.

Beehler, Joseph.....1503 West Lexington street.
Black, Samuel D.....White Hall, Baltimore county.
Childs, George S.....1222 East Townsend street.
Dehuff, Walter F.....1322 Homewood avenue.
Demitz, William M..... .....2324 East Lexington street.
Flaherty, Charles E..... 2117 Gough street.
Hack, Arthur E... .....1831 West Lanvale street.
Harris, Richard G..... .....2032 Linden avenue.
Hartlove, Harry H.....1108 North Stricker street.
Henneman, Milton P.....934 Milton Place.
Henthorn, Joseph T.....1417 West Pratt street.
Hess, Irving T..... .....1603 East North avenue.
Hoppert, Charles W.....1332 Ensor street.
Hoskins, John C..... 2133 Fairmount avenue.
Kenney, Thomas H.....1100 Haubert street.
Keyworth, J. Ernest.....851 Park avenue.
Knecht, Edward W.....1510 North Gay street.
Kurdle, Joseph..... .....834 North Bond street.
Mealy, Charles A..... .....Mt. Washington.
Mehrling, Harry..... 1631 West Mulberry street.
Mencken, John H.....2827 St. Paul street.
Moore, Albert G.....2100 St. Paul street.
Patterson, Alexander B..... ....2042 Park avenue.

Raidabaugh, John A.... ..... Sparrows' Point.
Siegle, John C..... ...1053 North Central avenue.
Stansbury, Charles E.....Grange P. O., Baltimore county.
Vincent, Sidney C.....Lutherville, Baltimore county.
Voneiff, George P..... .....1505 Linden avenue.
Walton, Ernest B.....1725 Bolton street.
Weatherlow, Guy P.....632 West Lombard street.
Weeks, John L.....336 Presstman street.
Williams, William L.....1114 Chesapeake street.
Yost, George K.....927 Milton Place.
Zimmerman, Albert.....2652 Pennsylvania avenue

JUNIOR CLASS—SECOND SECTION.

Albers, Edward .....1831 West Baltimore street.
Balke, William M.....1147 North Fulton avenue.
Baxter, Charles A..... .....2027 East Pratt street.
Bordley, J. Thompson.....Old York road, Waverly.
Brown, Robert H.....814 Gorsuch avenue, Waverly.
Conway, Ernest C..... .....1334 West North avenue.
Cox, Rodman..... .....873 Hollins street.
Eilman, Charles F..... 719 Hanover street.
Fleckenschildt, John K.....330 South Broadway.
Fritz, Henry T.....222 South Ann street.
Gibson, Arthur W..... 2526 West Baltimore street.
Grant, Charles W.....1803 Frederick avenue.
Goob, Charles T..... . .....2131 Jefferson street.
Houff, William.....1829 West Baltimore street.
Hubbard, Carlisle L.....1007 N. Caroline street.
Ijams, Walter M.....2005 Guilford avenue.
Johnson, William.....204 South Bond street.
Kemp, William W..... .....1730 East Fayette street.
Louderman, John P..... ..... .203 South Broadway.
Lowndes, Andrew J..... ... 613 Parkwyth avenue.
Lynch, Ross E.....Rockdale, Baltimore county.
Makibbin, Donald R.... .... 819 Harlem avenue.
Malone, Allen L..... .....1011 West Lanvale street.
Mason, Bradford..... .....515 Friendship street.
Murray, William J.....2303 North Calvert street.
Onnen, John G... .....1024 Ridgely street.
Prentiss, John V..... ....17 West Twentieth street.
Reinhardt, Thomas W.....1739 Park avenue.
Rosenthal, William B.....1830 West Pratt street.

Samuel, Edward.....810 South Bond street.
Schiff, Aaron M.....Raynor avenue and Florence street, Calverton.
Schlacter, Louis S.....Raynor avenue and Florence street, Calverton.
Slingluff, Charles B.....North avenue and Eighth street.
Sweeny, James B.....16 Woodbury avenue.
Tapman, Walter H.....1283 William street.
Weiss, Arthur S.....2007 Gough street.
Wilds, Louis C.....1022 North Broadway.
Zipp, Philip H.....1440 North Eden street.

Baltimore Polytechnic Institute

ORIGIN OF THE INSTITUTE.

HISTORICAL SKETCH.

The foundation of the Baltimore Polytechnic Institute was laid in a resolution adopted by the Board of Commissioners of Public Schools of Baltimore City, April 24, 1883. The fact having been generally recognized that the inability of our young men to secure more lucrative employment was the result of an incomplete system of education, the founders of the Institute held that those who leave our public schools should go forth, prepared not alone for the walks of a professional or mercantile life, but for the occupancy of those equally remunerative positions requiring a knowledge of the mechanic arts. It was believed that the field of labor would thus be widened, and our young men the more thoroughly and quickly fitted for self-support.

The force of the claim appealing to all, the logical result was the action taken by the Council on the 20th of October, 1883. On that date, at the instance of the Honorable John B. Wentz, the Board of Commissioners of Public Schools was empowered "to establish a school for manual training, under such name or title as said Board shall select." The Board thereupon established the Baltimore Manual Training School.

Though the enrollment during the first few years of the Institute's history was far from pleasing, it was equally far from discouraging, being ascribed to the natural objection of parents to send their sons to the school until its permanency should have been established, and the success of manual training assured. Some time was required, but the most conclusive evidence in that direction was eventually produced, and lay in the desirable positions secured by those who were graduated. The effect upon the enrollment was as gratifying as it was prompt, the number of students increasing with such rapidity as to render necessary the erection of the present building.

Since the addition of the facilities afforded by the more ample accommodations of this building, the growth of the Institute has been uninterrupted, and the community has come to look upon it as one of the most progressive and most useful institutions in the city, it ranking at the present time with our old-established high schools in popularity and attendance.

The present name—Baltimore Polytechnic Institute—was given to the school in May, 1893, and at the same time the title of principal was changed to president, and that of first assistant to vice-president.

OBJECT OF THE INSTITUTE.

The object of the Institute is the education of all the faculties; to give instruction and practice in the use of tools, and such instruction as may be deemed necessary in mathematics, drawing and the English branches of a high-school course. The manual instruction shall include carpentry, wood-turning, pattern-making, chipping and filing, forge work, moulding, soldering

and brazing, the use of machine-shop tools, and such other instruction of a similar character as may be deemed advisable to add to the foregoing from time to time, it being the intention to divide the working hours of the students as nearly as possible equally between manual and mental exercises. This Institute differs from other high schools in omitting from its curriculum ancient languages; in devoting more time to mechanical drawing; and particularly in affording scientific instruction and actual practice in the care and use of tools.

The Institute does not teach trades. Its aim is more comprehensive; it lays the foundation for many trades, and at the same time recognizes the value of intellectual discipline. It is not assumed that every boy who enters the Institute will be a mechanic. Some will find that they have no taste for manual arts, and will turn into other paths—law, medicine or literature. Some who develop both natural skill and strong intellectual powers will push on through the Polytechnic Institute into the higher realms of professional life, and become architects, draughtsmen, electricians, engineers or scientists. Others will find their greatest usefulness and happiness in some branch of mechanical work, into which they will readily step when they leave the Institute. All will gain intellectually by their experience in contact with things. The general result will be an increasing interest in engineering and manufacturing pursuits, shrewder merchants, more intelligent mechanics, more skillful manufacturers, better lawyers, more competent physicians and more useful citizens.

DEPARTMENTS OF THE INSTITUTE AND REQUIREMENTS FOR ADMISSION.

The Institute is divided into two departments—the Institute proper, and the Preparatory Department. The completion of the prescribed course of the latter requires three years, the grades corresponding to the sixth, seventh and eighth grades of our grammar schools. Before graduation a like period must be spent in the Institute proper, wherein the academic studies taught are essentially the same as those pursued in the first, second and third-year classes of the Baltimore City College.

Admission to any one of the various classes is secured through a transfer from a grammar school, an English-German school, or the Baltimore City College, or as a result of satisfactorily passing a general examination in the studies of the grade just below the one the candidate desires to enter.

Both departments are under the government of the President of the Institute, His Honor the Mayor, and a committee consisting of seven members of the Board of Public School Commissioners.

No candidate who has been guilty of truant-playing or any other grossly improper conduct during the scholastic year, shall be examined or admitted without authority of the Committee on the Polytechnic Institute; and it shall be the duty of the President to report all such candidates to the committee for its action.

No student who has been removed from the Polytechnic Institute shall be readmitted unless by special action of the committee.

The fee for use of tools, materials and books for students who are children of residents or citizens of Baltimore has been abolished. The fee for non-resident students is $12.50 per quarter, in advance.

In estimating and accounting for scholars, principals of grammar or English-German schools have the same credit for those sent to the Polytechnic Institute as to the City College.

REPORT OF THE PRESIDENT.

BALTIMORE, December 31, 1898.

To the Board of Commissioners of Public Schools:

GENTLEMEN: As required by the regulations, I have the honor to submit the fifteenth annual report, setting forth the condition and needs of the Baltimore Polytechnic Institute.

DAY CLASSES.

Number of students on roll, December 31, 1897.....	554		
Number of students admitted during the year.....	356		
Total number in the Institute during the year...		910	
Number withdrawn during the year.....	373		
Number graduated.....	29		
		402	
Number now on roll.....			508
Average enrollment during the year.....	484		
Per centage of attendance during the year.....	94.1		

NIGHT CLASSES.

Number on roll, December 31, 1897.....	728		
Number admitted during the year.....	708		
Total number in the Institute during the year...		1,436	
Number withdrawn during the year.....	654		
Number graduated.....	22		
		676	
Number now on roll.....			760
Total number now on roll in day and night classes.			1,268

The fourteenth anniversary of the founding of the Baltimore Polytechnic Institute was celebrated on April 14, 1898, in the main hall by a literary and musical entertainment. Talent furnished solely by the students.

The twelfth anniversary of the Preparatory Department was celebrated on April 16, 1898, the buildings being open for inspection of the friends of the students.

On June 21, the twelfth annual commencement of the Baltimore Polytechnic Institute, also the second annual commencement of the night classes of the Instutute, were held jointly at Ford's Grand Opera House. Reverend Llewellyn Stover Fulmer, the orator of the evening, delivered a fine address, advocating the great necessity for training, consequent on a course at the Baltimore Polytechnic Institute. His able remarks were received with great enthusiasm by the vast audience present. His Honor, the Mayor, Wm. T. Malster, presented the diplomas to the twenty-nine graduates of the day classes, also to the twenty-two graduates of the night classes. His Honor then gave an address of congratulation to the graduates, showing the advantages to be derived from a technical education which His Honor considered a real necessity of the present age, and each student acquiring it as adding to the country's need.

Honorable David E. Dick, after a fine address of commendation and congratulation to the recipients, presented the "Alumni Medal" and medal for "Proficiency in Mathematics" to Mr. Thomas Jefferson

Andrews, the "Saville Steam Engineering Medal" to Mr. Harry Rufus Ruse, the "Class '93 Electrical Engineering Medal" to Mr. Leo Bauersfeld, and to Mr. Alfred Cummins Hatch the medal for "Proficiency in German."

The Honorary Address was delivered by Mr. Harry Rufus Ruse, and the Salutatory Address by Mr. George Creamer Wilcox, and the Valedictory by Mr. Charles Raymond Gantz.

The triple expansion engine built by the graduating classes of '96, '97 and '98, and named by them the "Charles H. Gatch," in honor of the chairman of our committee, was placed on exhibition in the lobby of the Opera House, and was viewed, inspected and criticised by the immense audience present, and was pronounced by those competent to judge, a fine piece of marine engineering work, reflecting much credit upon the Institute, especially upon those engaged in its construction.

Since opening the night classes in October I have been compelled through want of space to refuse admission to more than seventeen hundred applicants. We need more space for the day, but far more for the night classes.

The Senior and Intermediate Classes with their instructors have visited Steelton and other manufacturing establishments around the city.

The class of '99 is building a 450-light dynamo, which, when completed, will be used to furnish current for lighting our buildings.

Owing to the fact that a sufficient number of students of the Institute did not take a course in the French language, we have omitted that study from our curriculum.

As a large number of boys are prevented from attending the Institute owing to their living at a great distance, I would recommend that at least four schools, composed of sixth, seventh and eighth grades, be established in different sections of the city, with curricula to correspond with that of the Institute. This has been tried in a number of other cities, and has given very satisfactory results.

We have fitted our forge shop with the Buffalo Forge Company's system of "Down Draft Forges," and since Mr. Devalin has been in charge our students in that shop are doing work equal to any school in the country.

Mr. Wm. P. Gundry and John E. Broadbelt, Jr., graduates of the Institute, have been appointed instructors; the former to succeed Mr. Ralph L. Williams, and the latter to the position formerly occupied by Mr. Wm. P. Gundry.

A vacancy in the faculty was caused by the decease of Ralph Leon Williams, who was lost in the Burgogne disaster of July 4, 1898.

Mr. Williams had been a student in the Institute prior to his appointment as an instructor, and the services rendered the school during both connections were most faithful.

I take this opportunity to testify to his excellent qualities as a man, a scholar, and a teacher; and to the loss the Institute sustains in his death.

The faculty of the Institute deserve mention for their zeal and devotion to duty, and their readiness to aid the President at all times.

To the Committee on Polytechnic Education, and the members and officers of the Board, and to His Honor the Mayor, I desire to return thanks for their help and kind consideration.

I enclose herewith estimates for the year 1899.

Very respectfully,

JOHN W. SAVILLE, *President.*

Estimates for the Year 1899.

Pay-roll for day instructors	$24,693 00
" " night "	4,100 00
Wood, iron, steel, brass, copper, tin, solder, etc., for lessons	900 00
Printing, commencement, catalogue, postage, and furniture repairs	540 00
Repairs to boilers, machines and tools	385 00
Wood and coal for power boilers and for heating buildings	650 00
Instruments, drawing paper, ink and colors	780 00
Gas and electric light	400 00
Apparatus and chemicals for chemical laboratory	261 00
" " material " physical "	225 00
" " " " electrical "	430 00
Painting old and new buildings	275 00
Stationery, ink, slates, black-boards, etc	360 00
Scientific books	200 00
Forty tables for free-hand drawing-room	800 00
Rebinding old books	90 00
Repairs to buildings	100 00
Incidental expenses	210 00
Total	$35,399 00

THE COURSE OF STUDY.

The course of study covers three years, and the school time of the student is about equally divided between mental and manual exercises. It is similar to the usual high school course, with the exception that the study of ancient languages is replaced by instruction in drawing and in the care and use of tools. One hour per day is given to drawing, one hour and a half to shop work, and two hours and a half to academic study.

The course of study embraces five parallel lines, as follows:

First. A course in Mathematics, including Algebra, Arithmetic, Book-keeping, Geometry, Mensuration and Trigonometry.

Second. A course in Science, including Chemistry, Geography, Physics, Physiology, Steam Engineering and Electricity.

Third. A course in the English, French and German Languages and Literatures, and in History.

Fourth. A course in Free-Hand and Mechanical Drawing and Designing.

Fifth. A course in Tool Instruction, including Carpentry, Wood Carving and Turning, Pattern Making, Moulding, Forging, Soldering, Brazing, Vise and Machine Shop Work, and the care and management of steam engines and boilers.

CURRICULUM.

JUNIOR YEAR.

Algebra	3	Physics	2
Double-entry Book-keeping	2	Physiology	2
English	3	Drawing	5
Geometry	2	Shop Work	9
History (English)	2		

INTERMEDIATE YEAR.

English	3	Geometry	4
History (Roman)	2	German	3
Physics	2	Drawing	5
French or Electricity	2	Shop work	9

SENIOR YEAR.		A CLASS.	
Electricity or French	2	Review of Mathematics	4
English Language	2	Steam Engineering	2
German Language	2	Trigonometry	3
History (Grecian)	1	Drawing	4
Physics and Chemistry	2	Shop work	8

I.—COURSE IN MATHEMATICS.

The studies of this course are pursued both on account of their close association with Physics, Machine-construction, Engineering, etc., and for the purpose of developing the reasoning powers.

ALGEBRA.—*Ray's Higher.*

JUNIOR YEAR.

The more difficult quadratics, the progressions, binominal theorem, indeterminate coefficients, series, continued fractions, computing and use of logarithms.

BOOK-KEEPING.—*Montgomery's.*

JUNIOR YEAR.

The theory of single entry, followed by practical work. The class is divided into a number of firms, actual business transactions being engaged in, and recorded in the various books.

SENIOR YEAR.

The subjects of single and double entry are explained and illustrated. Each student is required to complete several sets in single and double entry, using principal and auxiliary books. During the latter part of the year, practical work is done, the students engaging in business with each other, and keeping a complete record of all transactions. They are also thoroughly drilled in the use of commercial paper and business forms.

GEOMETRY.—*Wentworth's Plane and Solid.*
Phillip and Fisher's Plane and Solid.

JUNIOR YEAR.

The first four books, consisting of definitions, straight lines, angles, triangles, polygons, ratios and proportions, the circle, comparison of polygons, areas of polygons, and problems of construction.

INTERMEDIATE YEAR.

A review of the former year's work and the study of lines and planes in space, polyhedrons, cylinders, cones and the sphere.

TRIGONOMETRY.—*Wentworth's Plane.*

SENIOR YEAR.

The functions of the acute angles, the right triangles, oblique triangles, numerous problems and exercises.

II.—COURSE IN SCIENCE.

The course in science has for its purpose the direct teaching of useful knowledge, and the mental training which is derived from such instruction.

CHEMISTRY.—*Remsen's Elements of Chemistry.*

The chemical work consists of experiments in the laboratory from Remsen's Elements of Chemistry, performed by each student separately, written report upon the work done being made to the instructor, in which a full description of the experiments must be given and all reactions described and explained by equations. Recitations are also required, Remson's Elements being used as a text book.

PHYSICS.—*Gage's Elements of Physics.*

The study of physics consists of recitations and laboratory work. Experiments are selected from text book or arranged by the instructor and performed by the student at his table in the laboratory. Whenever a law of physics may be verified, measurements must be made, and such measurements given in the written report made to the instructor. Any attempt at forcing results to correspond to the law is not tolerated; but such discrepancies must be explained, and if possible remedied. Especial attention is given to the laws of machines.

ELECTRICITY AND MAGNETISM.—*Thompson's.*

The course in electricity is designed to impart to the student a general knowledge of the elementary principles of electricity; and also to give as much practical work as possible in measurements, wiring, and in the construction of electrical apparatus.

INTERMEDIATE YEAR.

The work of this class is mostly theoretical, in which students are drilled in the laws of electrical action, and preparing them for the more practical work of the senior class. Nearly half the time is devoted to laboratory practice in verifying the statements made in the lectures and text book.

SENIOR YEAR.

The preliminary theoretical work having been done in the intermediate year, the senior class devotes most of its time to the study of the various practical uses of electricity.

Special attention is given to commercial light and power supply. Special lessons are also given in dynamo, motor and line testing.

About one-half the time is devoted to laboratory work.

Students in this class are now building a 400-light dynamo, General Electric pattern, 4-pole, 125 volts, and are given practical work in wiring various rooms for electric lights.

PHYSIOLOGY.—*Hutchinson's Physiology and Dulany's Human Body.*

The student is impressed with the importance of this study, and is shown that through it he can acquire a knowledge of the mechanism and the laws which govern that most perfect, though complex machine, the human body.

The pernicious effects following cigarette smoking and the use of alcohol and narcotics are clearly and frequently presented.

During the entire course the students are brought into immediate contact with specimens of the various parts of the human body which are treated of in the text book, both in normal condition, and in condition as effected by the use of alcohol; frequent dissections on the inferior animals are made for instruction, and comparison and demonstrations made from alcoholic, dried and fresh specimens.

Frequent lectures are given upon the treatment of incised and other forms of wounds, and methods demonstrated that are calculated to induce healing in the shortest time. Theoretical as well as practical instruction in "First Help to the Injured" is continued throughout the entire course, the students being required to practice the lessons

given, in arresting hemorrhage, resuscitation from fainting, drowning or asphyxiation from gas, extemporing splints in case of fracture, and methods of carrying injured persons.

JUNIOR YEAR.

The work embraces a study of the functions of the organs of the human body, the skeleton, the skin, clothing, food, digestion, circulation, respiration, the nervous system, narcotics and their action on the body, mind and character.

INTERMEDIATE YEAR.

The work of the previous year is reviewed, and after a more comprehensive treatment the study is completed.

STEAM ENGINEERING.

The course in steam engineering embraces the theory and development of the steam engine, boilers and their appliances, heat, combustion, evaporation, indicator, diagrams, valve, valve motion and cut-offs, condensers and pumps, fire and water-tube boilers and their fittings, paddle and screw propulsion.

III—COURSE IN LANGUAGE AND LITERATURE.

This course is arranged to give the student such knowledge of the English language and literature as will enable him to express himself clearly, forcibly and with elegance.

COMPOSITION.

JUNIOR YEAR.

Instruction is given in the processes of invention, essentials of good diction, sentence structure, paragraph division and punctuation.

INTERMEDIATE YEAR.

Careful study is made of the qualities of style and the principles of descriptions and narratives.

SENIOR YEAR.

The students are required to write critical essays on the works of representative men, of English and American literature.

ENGLISH.

JUNIOR YEAR.

The common errors of speech are pointed out, and a special drilling is given in the correct use of English. Attention is paid to matters of most essential consequence to the student and such as will best serve to prepare him for the further study of language. The student is acquainted with the principles and relations that underlie the philosophy of language.

INTERMEDIATE YEAR.

The growth and progress of English and American literature is traced from the age of Chaucer to the age of Tennyson; the law and nature of its development are explained; all the great influences are noted; only such writers as are of the most importance to the student are studied.

SENIOR YEAR.

A brief history of language is given. A careful study is made of taste, its elements, characteristics and standard; pleasures of the imagination and their sources; sublimity and beauty of writing; wit, humor and ridicule; figures, their use and abuse; style, its varieties and essentials; and criticism. Extemporaneous speaking is taught, in connection with which the principles and essentials of argument are explained.

GERMAN.

The aim in this course is to teach the student sufficient to enable him to read ordinary prose composition.

INTERMEDIATE YEAR.

Exercises in grammar and composition. Conversational exercises.

SENIOR YEAR.

Exercises in composition and grammar from Otis' Grammar. Review. Translation of Shiller's Neffe als Onkel.

HISTORY.

JUNIOR YEAR.

Montgomery's History of England.

INTERMEDIATE YEAR.

Allen's History of Rome.

SENIOR YEAR.

Myers' Eastern Nations and Greece.

TEXT-BOOKS.

Algebra—Ray's Series.
Wentworth's Series.

Geometry—Wentworth's Plane and Solid.
Phillips and Fisher's Plane and Solid.

Trigonometry—Wentworth's Plane and Spherical.

Book-keeping—Montgomery's Modern Single and Double Entry.

English Language—Whitney and Lockwood's English Grammar.
Sheldon's Advanced Language Lessons.
Buehler's Exercises in English.
Hill's Rhetoric.
Lounsbury's History of English.

English Literature—Shaw's New History.

German—Otis Elementary German.
Brandt's German Grammar.
Schiller's Der Neffe Als Onkel.

History—Eggleston's History of the United States.
Montgomery's Leading Facts in English History.
Myers' Eastern Nations and Greece.
Allen's History of Rome.

Physiology—Dulany-Martin's (Human Body).
Hutchison's.

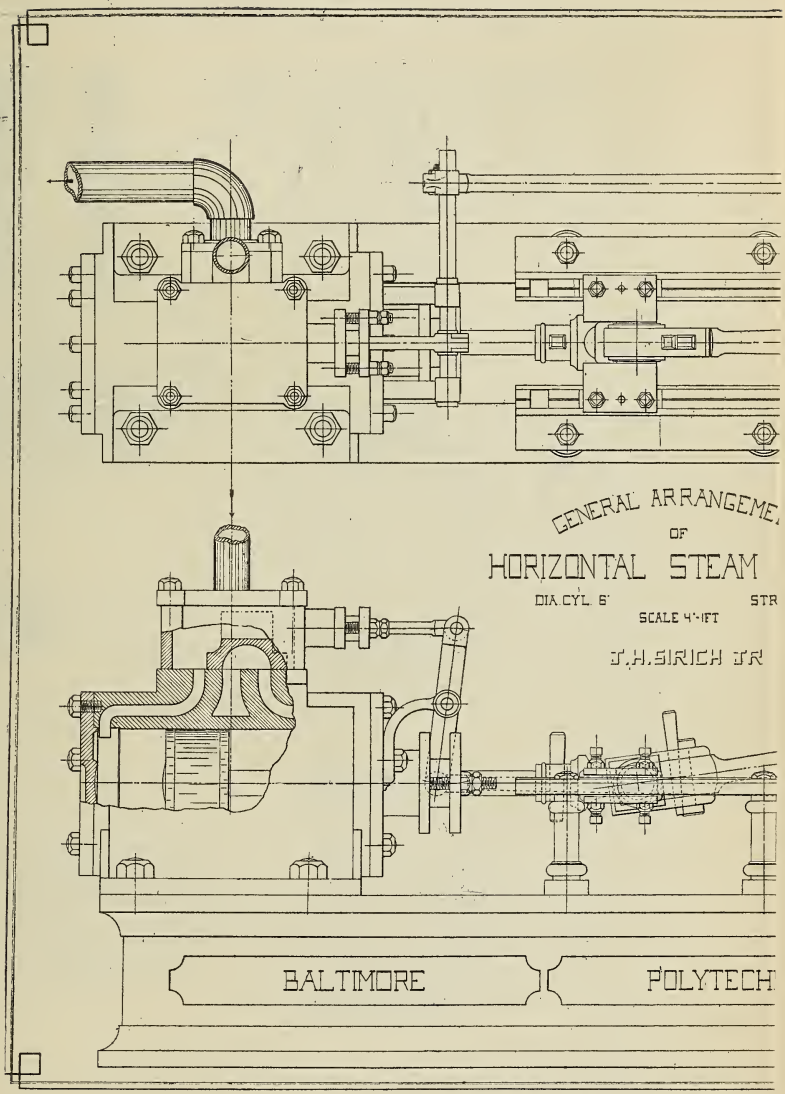
Physics—Peck-Ganot's Natural Philosophy.
Gage's Elements of Physics.

Electricity—Thompson's Electricity and Magnetism.

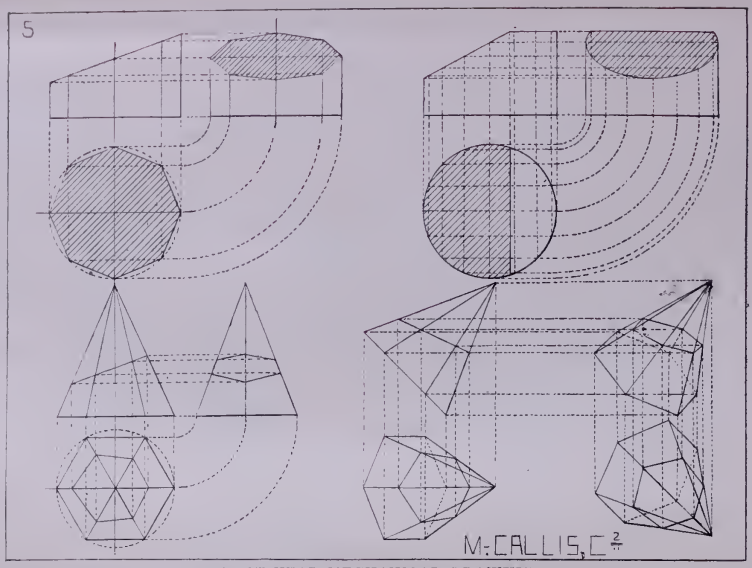
Chemistry—Remsen's Briefer Course.

Steam Engineering—Shock on Steam Boilers.
Seaton's Marine Engineering.
Holmes' Steam Engine.

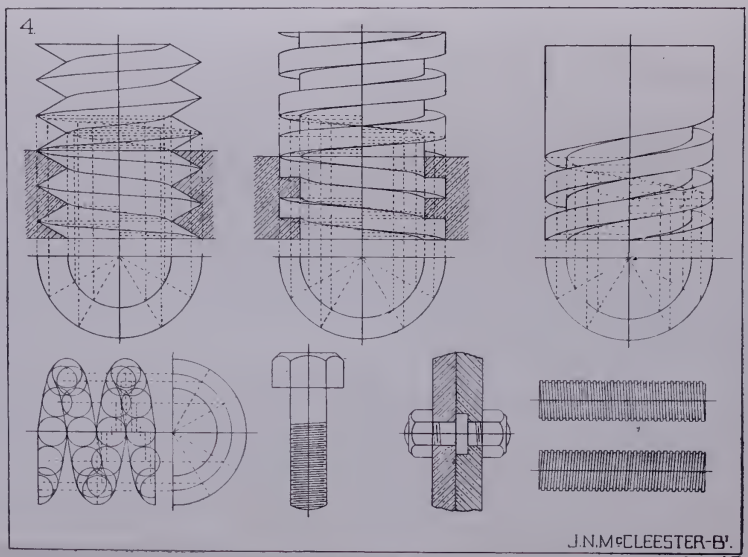
Miscellaneous—Rose's Complete Practical Machinist.
Rose's Pattern Maker's Assistant.
Byrne's Metal Worker's Assistant.
Thompson's Electricity.



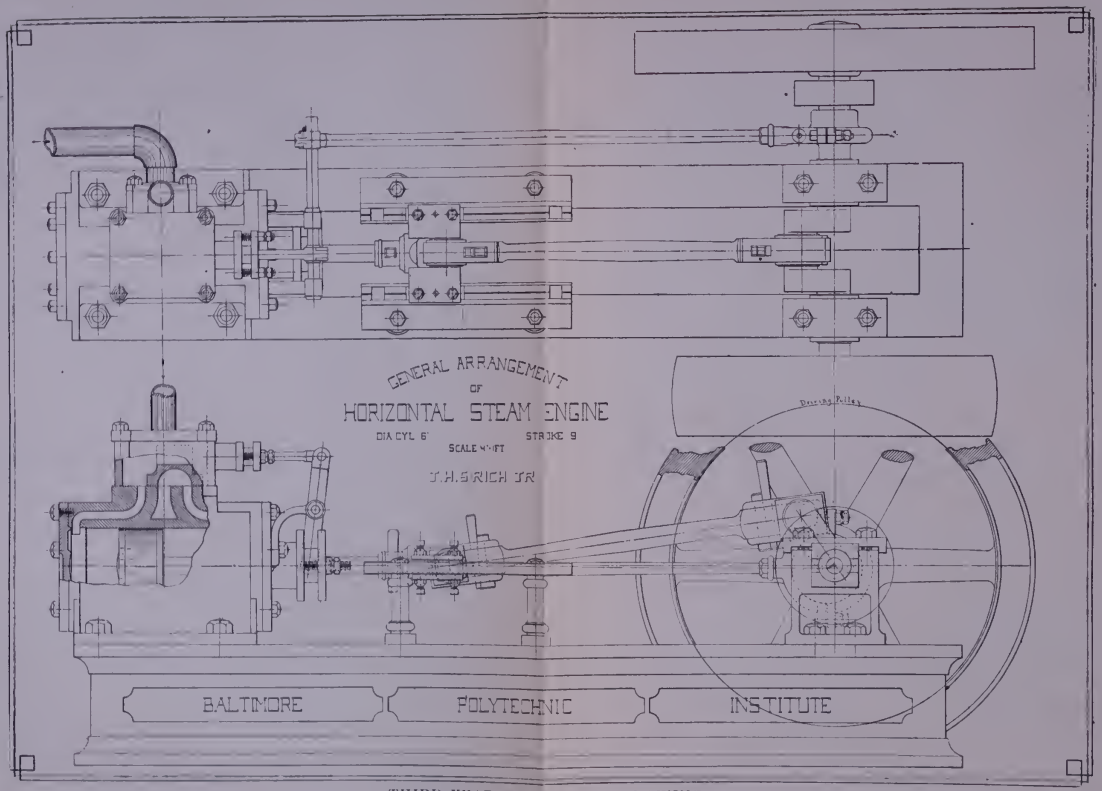
THIRD YEAR MECH



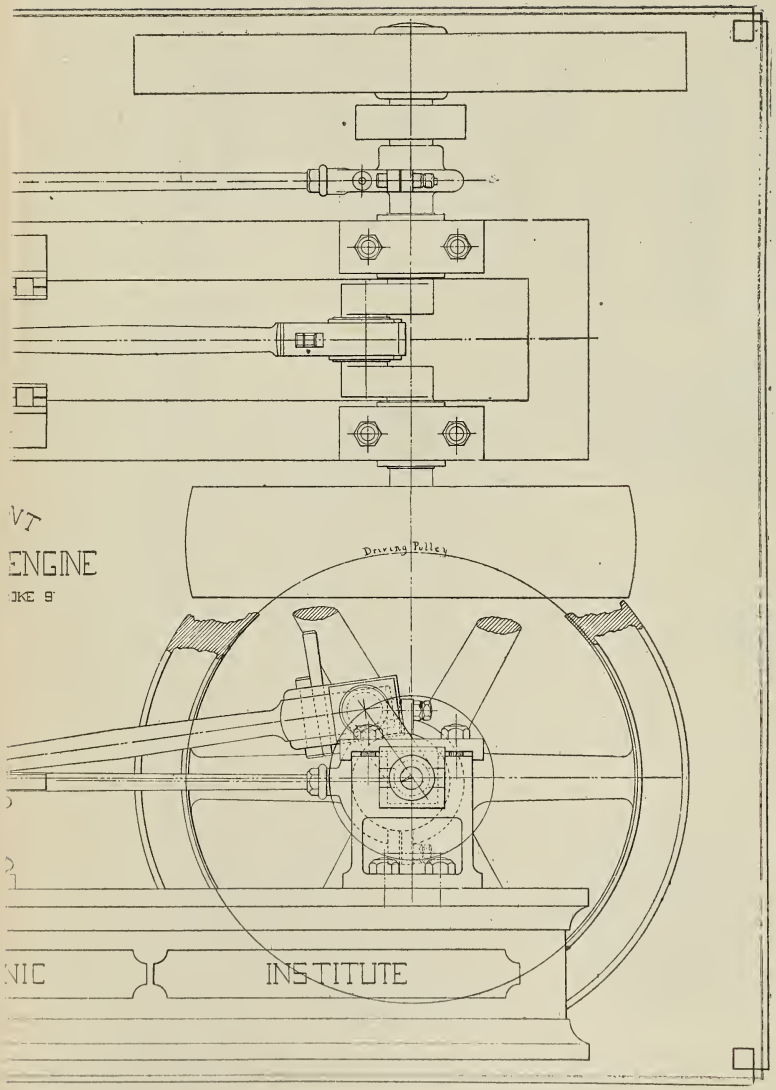
FIRST YEAR MECHANICAL DRAWING.



SECOND YEAR MECHANICAL DRAWING.



THIRD YEAR MECHANICAL DRAWING.



IANICAL DRAWING.

IV.—COURSE IN MECHANICAL DRAWING.

The mechanical drawing-room is furnished with individual combination drawing tables, in which each student is provided with private lockers for his materials, including his drawing board.

In arranging the course in mechanical drawing the aim has been to impart to the student as much knowledge of the *principles* of the subject as time will permit.

Personal instruction is given to each student, besides the regular class lectures, which are given in as clear and practical a form as possible, *from models.* Students are required to use these models in making their drawings, and are never permitted to copy from the flat.

During the year, at certain stated times, reviews of the work are given to refresh the students' minds.

COURSE OF INSTRUCTION.

FIRST YEAR.

Five Fifty-Minute Periods Per Week.

Description, preparation and testing of drawing instruments and materials. Graphic solutions of geometrical problems, the problems being selected with special reference to draughting.

Simple projections.

Intersection of solids.

Development of surfaces.

Simple details of machines.

Free-hand pencil sketching of machine details (with dimensions) from models; from which sketches drawings are required to be made, each student working from his own sketches and the models.

SECOND YEAR.

Five Fifty-Minute Periods Per Week.

The construction of various kinds of curves.

Intersection of solids.

Conic sections and development of surfaces.

The construction of various kinds of screw threads.

Pulleys and belts.

Gearing, in which the involute and cycloidal tooth are constructed and applied to spur and bevel gears.

Construction of cams.

Free-hand sketching of machine details, with dimensions, from models; from which sketches drawings are required to be made, each student working from his own sketches and the models.

Quarterly each student is required to draw a plate at home, showing the application of the different principals of work already explained.

THIRD YEAR.

Four Fifty-Minute Periods Per Week.

Elements of mechanical motions; sketching, measuring and drawing of details, and arrangements of machinery from models; from which sketches a complete set of working drawings are required to be made. Quarterly, each student is required to draw a plate, at home, showing the application of the diffierent principals of work already explained.

Tracing and blue printing.

OPTIONAL.

Engineering drawing, civil, mining and topographical.

SCHEDULE OF SHOP WORK.

FIRST YEAR.

Carpentry, 15 weeks; Wood-turning, 5 weeks; Forging, 20 weeks.

SECOND YEAR.

Pattern-making, 15 weeks; Moulding, 5 weeks; Chipping and Filing, 20 weeks.

THIRD YEAR.

Machine shop work, 40 weeks.

CARPENTRY.

The course of instruction consists of the study of wood; its structure, composition, drying and warping properties; the defects in and kinds of wood; also its value and the method of measuring it. The care and use of tools, and construction of the following: Square prism, sawkerfing, trenching, chamfering, centre lap joint, corner lap, half lap, dove tail, open mortise and tenon, miter mortise and tenon, plain nailed box, dove tails and chess board.

WOOD-CARVING.

For those who have completed preparatory course in carpentry.

FIRST YEAR—*Twenty Weeks.*

Care and use of tools, and fourteen progressive lessons, and designing.

WOOD-TURNING.

FIRST YEAR—*Five Weeks.*

Principle of the lathe explained.

Names of parts of lathe, and names and uses of various finishing tools that belong to the lathe. A course of turning consists of sixteen lessons between centers, and eight lessons in chuck work.

Frames of part of lathe. Care and use of turning tools. Lectures.

1. Cylinder between centres.
2. Cone between centres.
3. Step cylinder between centres.
4. Geometrical piece in angles.
5. Inverted cones between centres.
6. Bolt.
7. Geometrical piece.
8. Geometrical piece in round.
9. Geometrical piece, table leg.
10. Geometrical piece in round.
11. Chuck work.
12. Chuck work.
13. Chuck work.
14. Vase.
15. Goblet.
16. Vase.
17. Vase.
18. Vase.
19. Sphere.

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COURSE IN FORGE SHOP.

FIRST YEAR—*Twenty Weeks.*

LECTURES.

Forge—Mechanism and care of forge and smith's tools, preparation of forge for fire, building and managing the fire, heat of fire, fluxes.

Tools—Anvil, sledge, hand hammer, square tongs of various kinds, hot chisel, cold chisel, swedges, fullers, flatters, formers, heading tools, mandrels.

Forging—Forge square iron out of round, round out of square, octagonal out of square, hexagonal out of round; head up a rivet, head up a bolt.

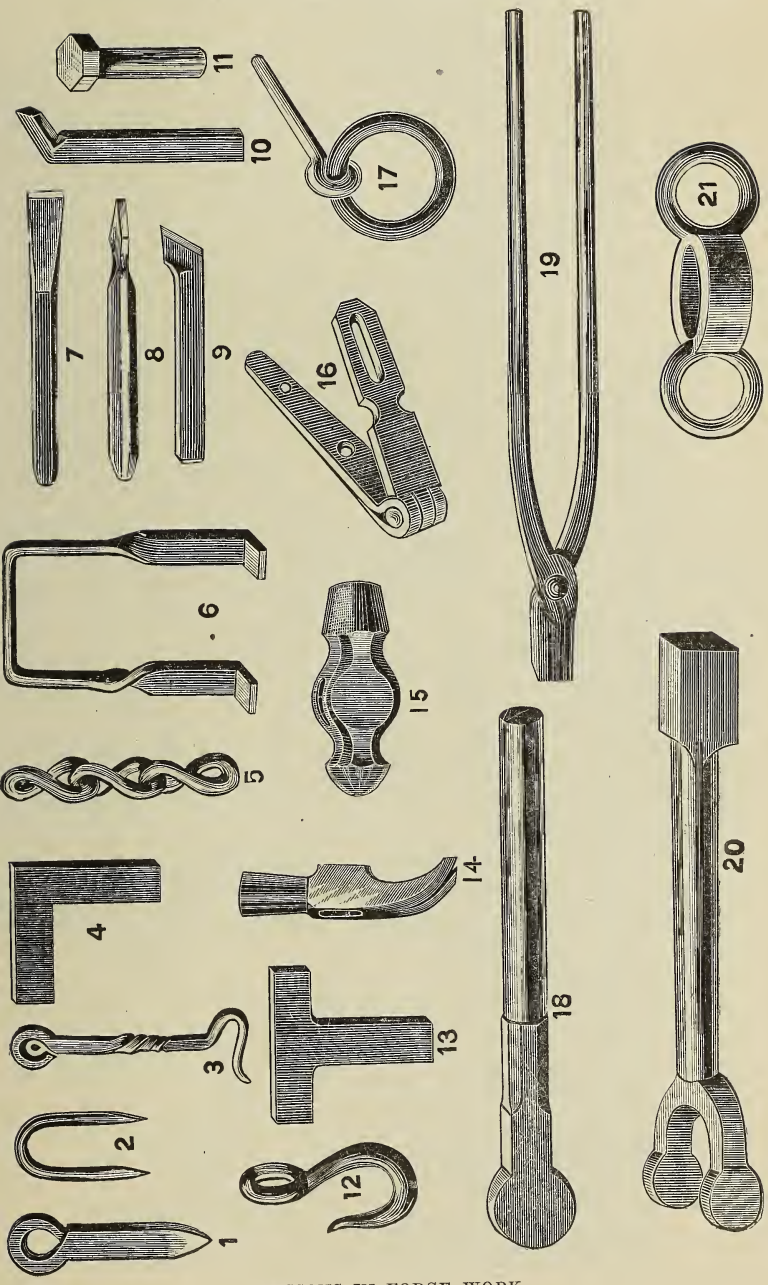
Bending—Turn a piece of flat iron to a right angle, the corners being brought square and neat; turn a flange, bend an eye, make a square out of a piece of flat iron.

Welding—Make a jump weld, weld two pieces together forming a cross, a scarf weld, a pipe weld, bend and weld washer of flat iron, make a round ring out of a piece of square iron, weld a square, make four or five links of a chain out of three-eighths round iron, weld iron to steel.

Tool Making—Forge and finish a set of tools, a wedge centre punch, flat-nose caulking tool, cape chisel, cold chisel, a drift, heading-tool callipers, straight edge, T square, hand hammer, set of drills, set of lathe tools, make and finish a (cross pene) fitter's hammer, a (cross pene) chipping hammer, a (straight pene) chipping hammer, a (round pene) blacksmith's hammer.

Tempering—Theory of tempering, temperatures and colors, water, oil, etc. Temper chisels, turning and boring tools for wood and metals.

Note.—Students while in the forge shop will be required to make the tools used by them in chipping and filing and machine shop.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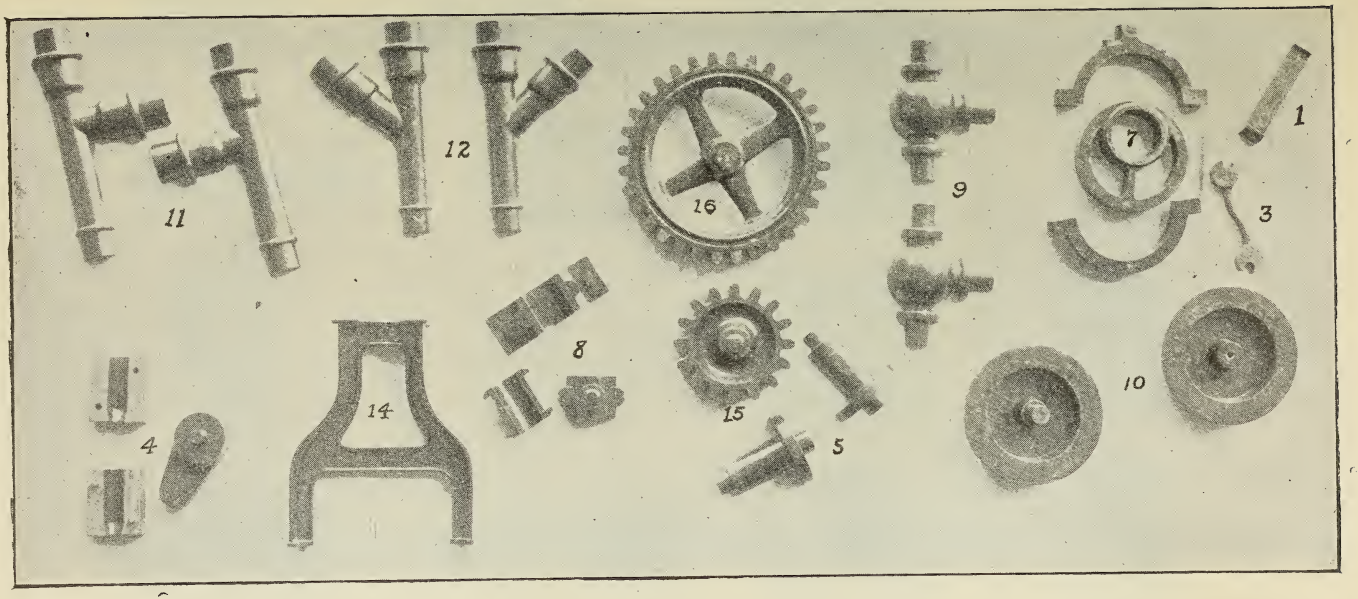
PATTERN-MAKING.

SECOND YEAR—*Fifteen Weeks.*

1. Gib.
2. Wrench.
3. Wrench.
4. Crank.
5. Gland.
6. Lathe glide.
7. Eccentric.
8. Pillow block.
9. Globe valve.
10. Sheave pattern.
11. T Branch pipe-fitting.
12. Y Branch pipe-fitting.
13. Leg pattern.
14. Pinion wheel.
15. Large wheel.

Lectures. Tools used in pattern-making-lathe. Elementary principles, methods of construction, of preventing warping of patterns; allowance for shrinkage, "draft" explained and principles illustrated by moulding process.

Note.—Students of the second year class are required to make the patterns of mechanical the object to be built during their graduating year.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VISE WORK.

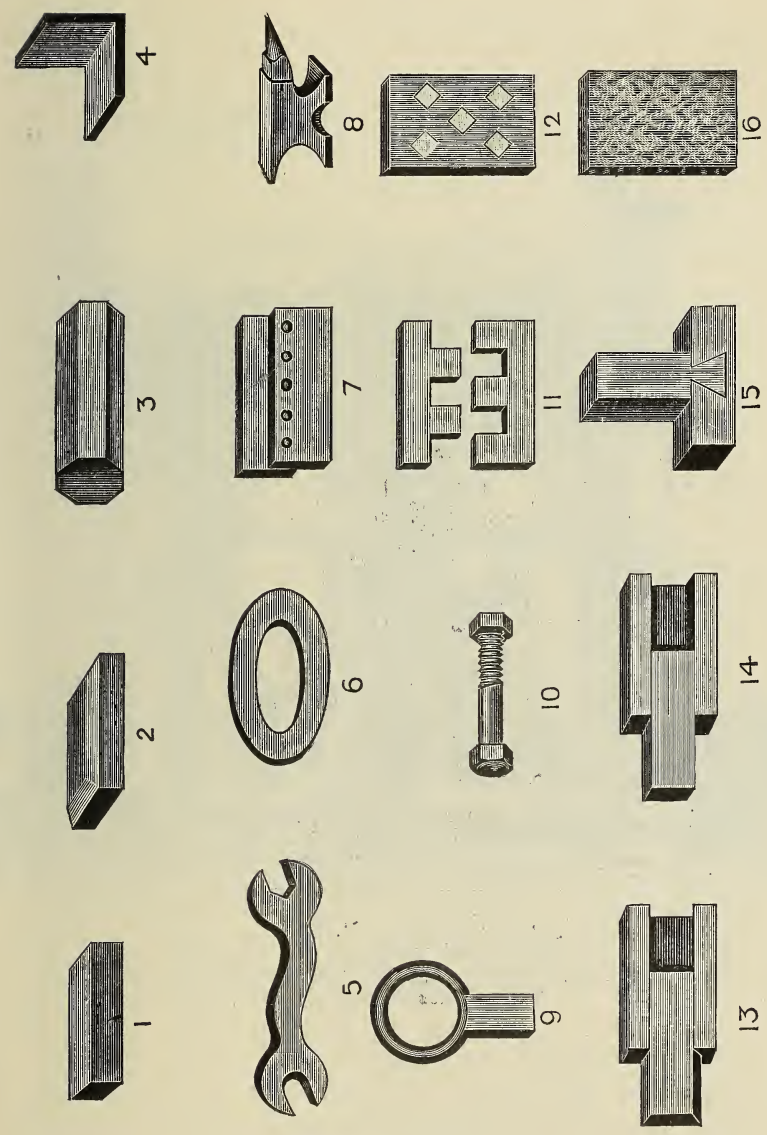
SECOND YEAR—*Twenty Weeks.*

Care and use of tools. Lectures.

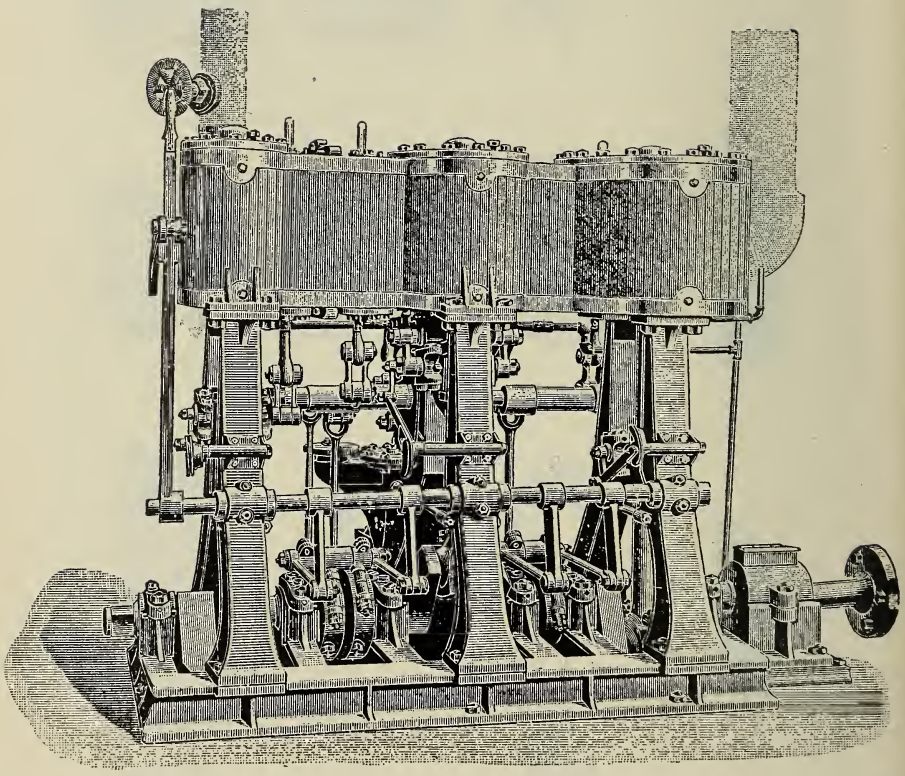
1. Various chisels and chipping.
2. Rectangular block with champered edges.
3. Octagonal prism.
4. Angle piece.
5. Wrench.
6. Eclipse.
7. Riveting.
8. Anvil.
9. Circle and segment.
10. Use of dies and taps, threading bolt and nut.
11. Interlocking piece.
12. Inlaid piece.
13. Dovetail slide.
14. Open slide.
15. Dovetail.
16. Scraped surface.

THIRD YEAR—*Forty Weeks.*

Machine shop work.
Twist drill.
Hand reamer.
Rose bit.
Set taps, taper plug and bottom.
Spur gear.
Bevel gear.
Worm gear.
Spiral gear.
Stub end, strap and brasses.
Machining test specimens for testing machine.
Name, uses and care of hand and machine tools. Lectures.
Finish up a design for graduation.



LESSONS IN VISE WORK.



"The Charles H. Gatch."
Triple Expansion Marine Engine. 100 I. H. P.
First Section finished by Class '95; Second Section by Class '96;
Third Section by Class '97 and '98.

EQUIPMENT OF THE INSTITUTE.

SCIENCE DEPARTMENT.

ELECTRICITY.

The electrical equipment of the Institute is selected to give practice to the student in verifying the laws and making tests of various kinds and of a practical character.

Many of the instruments are of two grades, the preliminary work being done on the cruder and stronger kind, and then, when the student has learned to manipulate properly, the finer and more expensive ones are furnished.

The laboratory and lecture room are both lighted by electricity, a switchboard controlling the lights in the laboratory, giving the student practical illustrations of switchboard work.

Galvanometers, bridges, voltmeters, ammeters, resistance boxes, dynamos, motors, accumulators, induction coils, transformers, wattmeters and such appliances are among the apparatus.

The department will shortly have added to it a 400-light dynamo and an automatic cut-off engine to drive it, both of which are now being built by the students.

CHEMICAL AND PHYSICAL LABORATORY.

Room lighted by electricity and fitted with working tables of cypress wood, accommodating at one time twenty-three students working separately, or forty-six working in pairs. Tables are fitted with water, gas and waste bowls. The tops are slate and each division, designed for one student, is constructed with four lockers, four drawers and a double rack, on which reagents are kept. Allowing two students to each locker and drawer, 184 students can be accommodated during the week. The chemical equipment consists of such appliances and glassware as are necessary for the experiments, each student being allowed test tubes and rack, beakers, evaporating dishes, etc., and the larger and more expensive apparatus furnished as needed.

The physical experiments are performed with instruments from the best makers, and are used to illustrate the most important phenomena and laws of mechanics, hydraulics, pneumatics, acoustics, thermics and optics.

Lecture room is lighted by electricity, and is fitted with opera chairs arranged in four tiers of ten each.

The lecture table contains a pneumatic trough and waste bowl, and is supplied with water and gas.

Capacity, 50 students at one time, or 300 per day.

ANATOMY, PHYSIOLOGY AND HYGIENE.

Lecture and recitation room fitted with forty folding opera chairs, arranged in four tiers, giving each student plain view of all demonstrations.

One set anatomical charts.

One physiological manikin.

One plate microscopic sections.

One human skeleton, articulated by the students.

One human skeleton, articulated in France, for teaching purposes.

Alcoholic specimens and preparations illustrating effects of alcohol, tobacco, etc., upon the internal organs.

Five large microscopes, microtome with freezing attachment, mounted sections, mounting material and apparatus for preparation of microscopic slides.

One large demonstrating table.

A museum of natural history has been commenced, most of the specimens having been collected and donated by the pupils.

Apparatus for the demonstration of many of the physiological processes.

Apparatus for practical instruction in "First Help to the Injured."

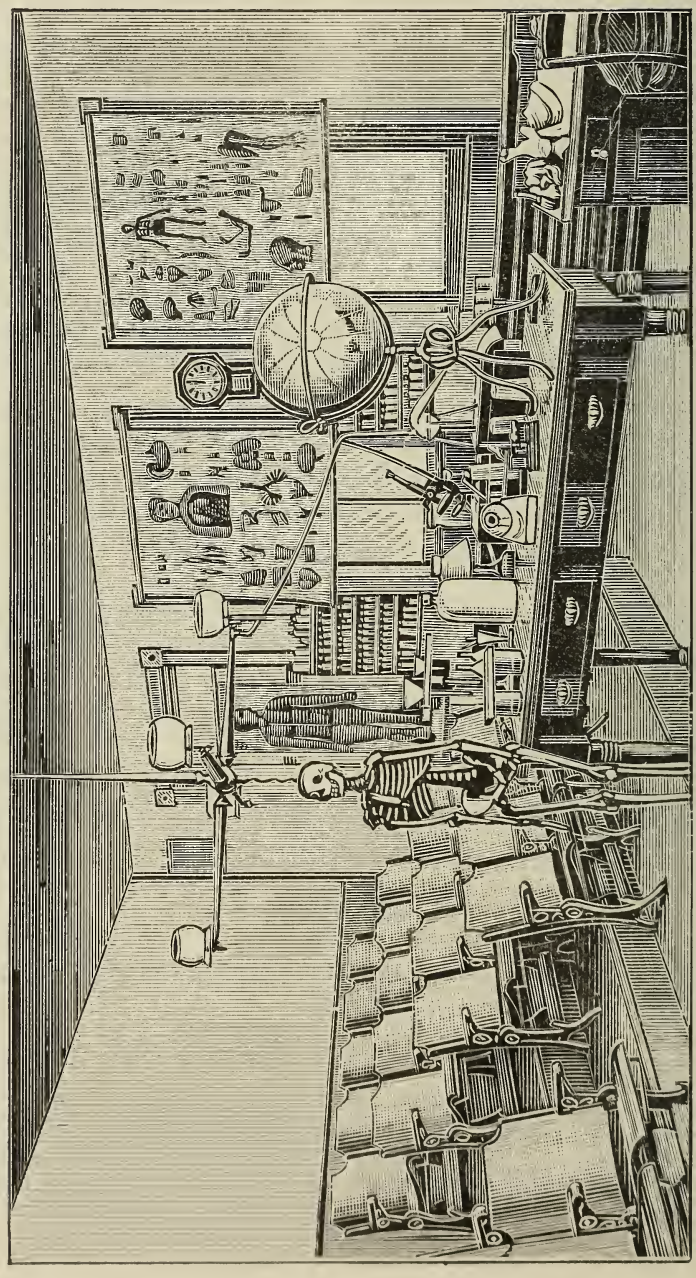
GEOGRAPHY.

One "Yaggy's" geographical study chart, with profile map of the United States.

Wall maps of Europe, Asia, Africa, United States and Maryland.

One large, full-mounted terrestrial globe.

One large relief globe.



ANATOMY, PHYSIOLOGY AND HYGIENE.

GEOLOGY.

A collection illustrating scale of hardness.

A collection illustrating the scale of fusibility.

A collection for microscopic study.

A collection of the more common minerals, rocks and ores, and geological charts.

A collection illustrating the various fuels.

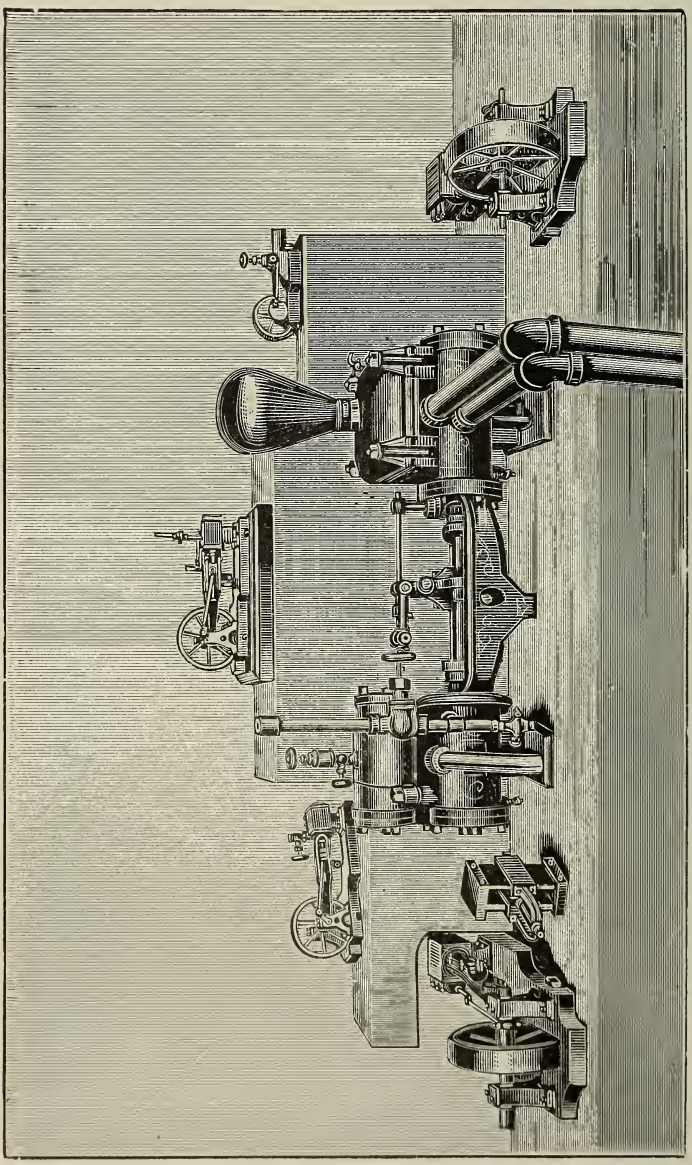
A collection illustrating the various building materials.

LIBRARY.

The Library is furnished with 2,039 volumes of scientific and English literary works and reports, besides nearly all the American scientific weeklies and monthlies, for circulation among the instructors and students.

DEPARTMENT OF STEAM ENGINEERING.

This department is fitted up with forty lecture-room chairs. It contains a working model of the Worthington Duplex Steam Pump, a model of the Campbell & Zell boiler, both of which were presented to the school by the patentees, a number of steam gauges and safety valves, a hydrometer, a working model of a slide valve engine (built by the students), a Tabor steam engine indicator, a pantograph, a Coffin planimeter and specimens of the different kinds of riveted boiler plates.



"The Simon L. Felber." Blake Steam Pump.
Built by Class '91.

FIRST DRAWING ROOM.

FREE HAND.

Drawing tables for 50 students at one time, or 300 per day. Drawing boards for 300 students, models and copies, plaster cast of the human body, and ornaments.

Each pupil is supplied with models for individual study.

SECOND DRAWING ROOM.

MECHANICAL.

Drawing tables for 50 students at one time, or 300 per day. Drawing boards, T squares, triangles and instruments for 300 students, models of fundamental, simple and complex forms.

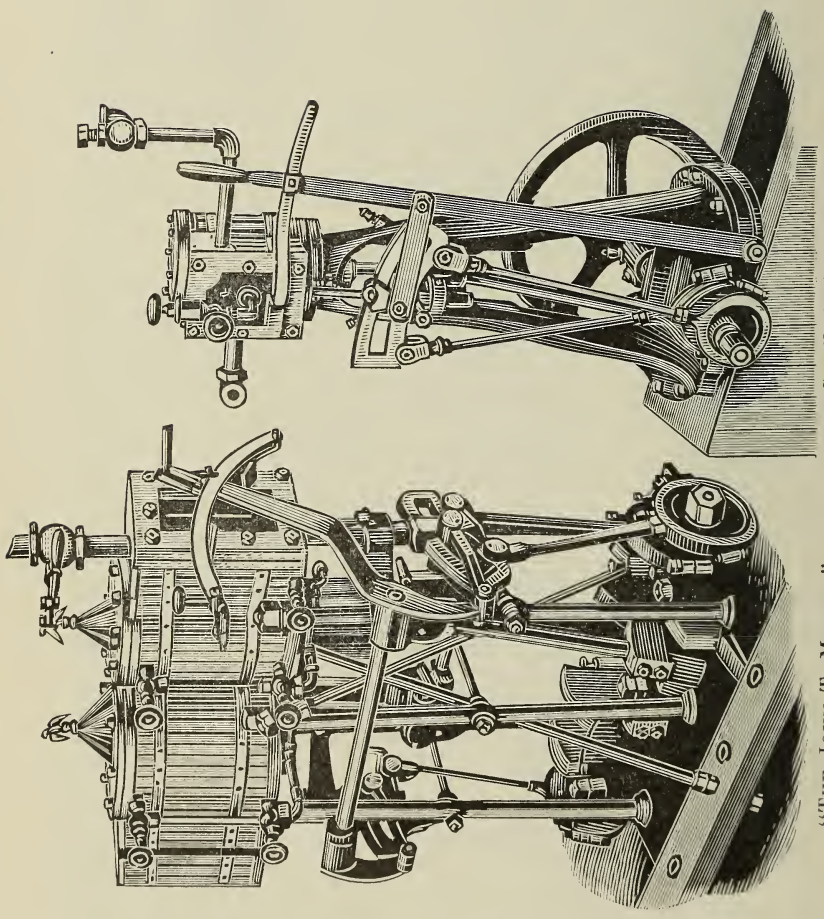
MECHANICAL DEPARTMENT.

FIRST—WOOD-WORKING SHOPS.

Twelve (double) carpenters' benches, for 24 students at one time, or 144 per day, five small turning lathes, five scroll saws and one grindstone, with tools for 144 students. The bench tools consist of a jack plane, smoothing plane, fore plane, cross-cut saw, rip saw, tenon saw, hand hammer, mallet, brace, six bits (assorted sizes), bevel, two-foot rule, six chisels (assorted widths), oil stone, drawing knife, spoke shave, try square, brad awl, punch, chalk line, oil can, hand brush, bench hook and note-book and pencil.

SECOND—WOOD-WORKING SHOP.

Twenty-seven (double) carpenters' and cabinet-makers' benches for 54 students at one time, with tools, as in last-named shop, for 172 boys per day.



"The John T. Morris."
Compound Marine Engine. 65 I. H. P.
(Built by Class of '91.)

Small Yacht Engine.
3 I. H. P.

ARMORY.

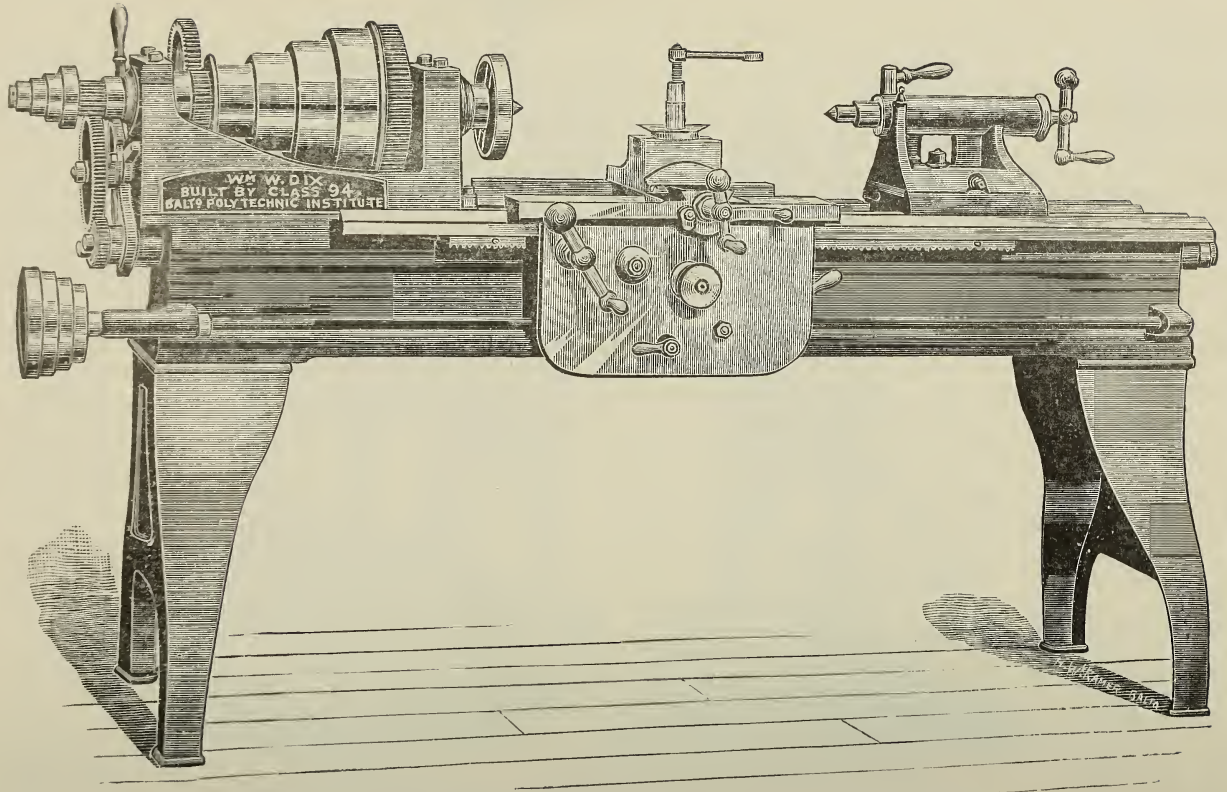
The armory contains 75 muskets and 75 short rifles for exercise in the manual of arms.

PATTERN-MAKING SHOP.

The pattern-making shop is on the south side of the second floor. Its dimensions are 20x64 feet. The equipment consists of twelve double benches and two single ones, with six drawers, and a double tool case to each double bench. Each drawer contains one set of paring chisels and a set of plane bits. Each tool case contains one set of tools for either pattern-maker or carpenter. The department is supplied with one hand saw, one scroll saw, eleven wood-turning lathes, one trimmer, one planer, one band saw-filing machine, two grind stones and one emory grinder, also extra cases with special tools of all kinds, sufficient to instruct 25 students at one time, or 150 in each day.

FORGE SHOP.

Located on the ground floor, and containing 1,600 square feet of cemented floor space. Fitted with Buffalo stationary blast forges, the beds of which are 24 inches by 36 inches each, with down draft exhaust hoods, anti-clinker dumping tuyeres and blast-gates. Attached to each forge are two cast iron tanks, one for coal and one for water; racks for tongs and tools are fitted to the tanks. The forges are arranged in two rows, five in each row, placed back to back near the centre line of the shop. Near one end of the shop two forges are placed, one on each side of the contral rows, forming in shape the letter T. On one side of the central row, and at the opposite end of

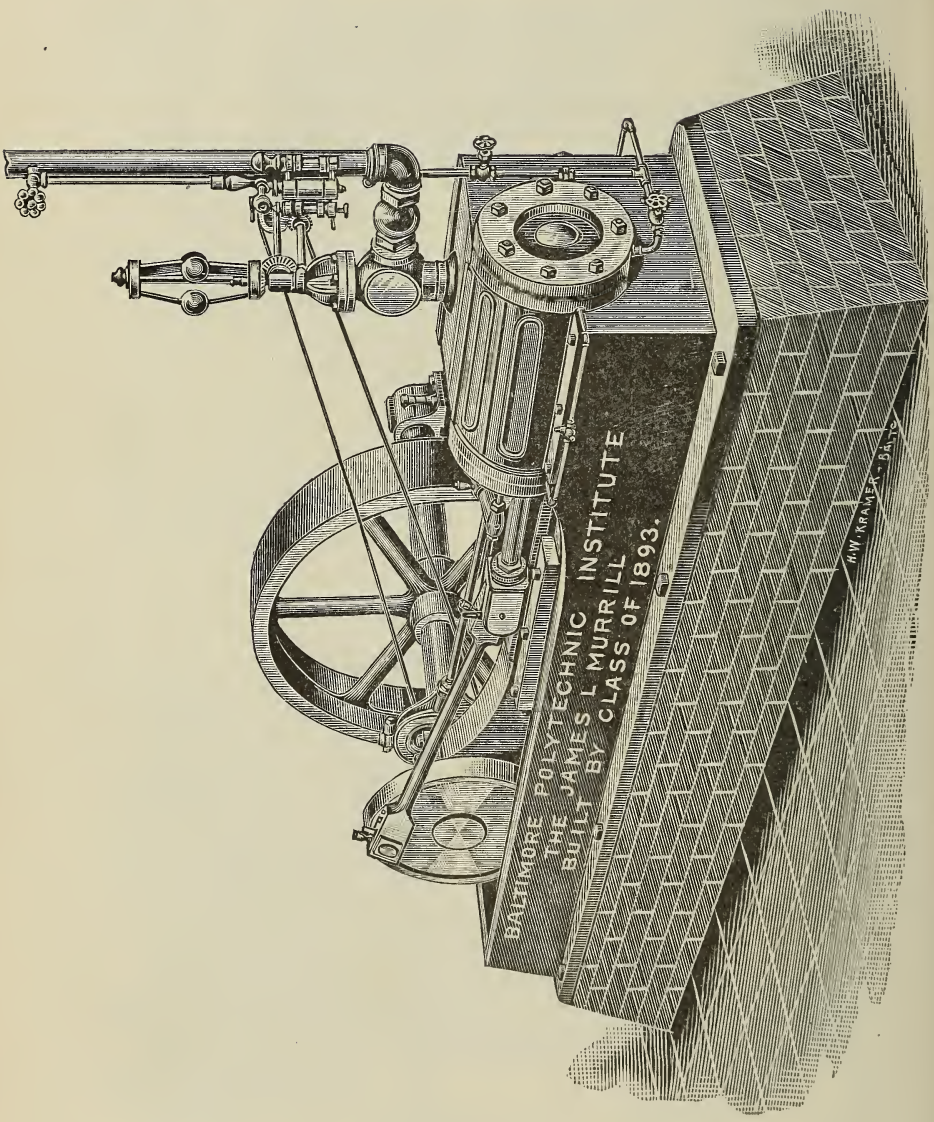


"The William W. Dix." Engine Lathe, 8-foot Bed, 14-inch Swing.
Used in shop as part of plant. Built by Class '94.

the shop, one forge is placed, forming with the central row the shape of the letter L—making thirteen forges in all. The forges receive the blast from a No. 7 steam pressure blower, located in one corner of the shop. The products of combustion are carried off by a No. 8 pattern Buffalo exhaust fan. Placed conveniently to each forge is an anvil of 125 pounds weight, firmly strapped to blocks securely planted in the ground. A work bench twelve feet long, fitted with four vises, is placed against the side wall, under the windows. A grind stone is located near one corner of the shop. A portable black-board, pivoted in a frame, is conveniently placed in the room. The tools consist of a number of hand hammers, sledge hammers, tongs, cold and hot chisels, swedges, flatters, set hammers, fullers, hardies, heading tools, punches, callipers, squares, mandrels, etc.

SHEET METAL-WORKING DEPARTMENTS.

Fitted for soldering, brazing and annealing, with a sufficient number of benches and gas soldering-iron heaters to accommodate 50 students at one time, or 300 per day. One small cornice brake, two forming, three folding, two wiring, one beading, two turning and six burring machines; two mandrels, three beak horns, five double-seaming, two conductor, seven square-face, three blow-horn, two creasing, two candlestick mould, three needle-case, two bottom, two round-head and three hatchet stakes; shears, riveting hammers, raising hammers, chisels, squares, mallets, rivet sets, steel punches, compasses, soldering-irons and grooving tools, dividers, lead blocks for punching sheet metal, wooden rules, flat chisels and nine bench vises.



"The James L. Murrill." 20 H. P. Horizontal Slide Valve Engine.
Used for furnishing power in shops. Built by Class '93.

MACHINE SHOP.

No. 1 Brown & Sharpe Universal Milling Machine, with overhanging arm; one 24-inch swing by 12-foot engine lathe, with table for cylinder, built by Draper Machine Company; eight 10-inch by 3½-foot bed engine lathes, made by W. C. Young & Co.; four 10-inch swing by 4-foot bed engine lathes, made by F. E. Reid; one 12-inch swing by 5-foot bed engine lathe, made by W. C. Young & Co.; four 14-inch swing by 6-foot bed engine lathes, and one 15-inch swing by 8-foot bed engine lathe, made by Prentice Bros.; one 16-inch swing by 9-foot bed engine lathe, made by W. C. Young & Co.; one engine lathe, 8-foot bed by 14-inch swing, built by students of the Institute, Class of '94; one metal planer, 18 inches square; one 24x24x6-foot planer; one Universal cutter and reamer grinder; one 50,000-pound testing machine (Riehle); planer, 18x18x4-foot table, made by Putnam; one Bickford radial drill; drills to centre of circle, 5 feet 9 inches; one 20-inch wheel feed drill press; two 6-inch Boynton & Plummer shapers, and one shaper, 15-inch stroke; one double emory grinder for 10-inch wheels (dry); one 24-inch Barnes' water emory grinder; one Worcester twist drill grinder, style B; one 24-inch grind-stone and trough; thirty vises and benches for same; one set pipe tools, from one-eighth of an inch to two inches; one 12-inch three-jaw combination chuck; three 7-inch three jaw combination chucks; three 4-inch three-jaw scroll chucks; drill chucks, twist drills, tap reamers, files, chisels, hammers, scales, squares, etc., for 150 students. These shops were fitted up by the students and instructors.

Power is supplied by two Campbell & Zell boilers, and a 25-horse power horizontal direct-acting steam engine (of 9-inch diameter of cylinder and 14-inch stroke of piston), built by the members of the graduating class of 1893.

ALUMNI.

CLASS OF '87.

Clarence G. Bouis, Manager Monumental Label Works.
George C. Bump, Baltimore City Passenger Railway Company.
Lucien Dallam, Mercantile Trust Company.
Otto H. Ehlers, Maryland Steel Company.
Osma K. Gardner, Machine Supplies, with Messrs. Carey & Co.
Herbert F. Gorgas, D. D. S.
Joseph Greenbaum, Civil Engineer, City Commissioner's Office, Baltimore, Md.
Harry W. Hahn, Draughtsman, J. Patten & Co., New York City.
Minor F. Heiskell, Edison Electric Works, Schenectady, N. Y.
Robert Hooper, Mechanical Department, Northern Central Railway Company.
William S. Hugg, Book-keeper, with Messrs. Kimball, Tyler & Co.
Thomas J. Irons, South Baltimore Chemical Company.
Joseph H. Kuehn, Machinist, with Messrs. Stevenson & Company.
P. Charles Nelson, Mechanical Department, with Messrs. Dietrick, Harvey & Co.
Flavius J. Pennington, Newport News Ship-Building and Dry Dock Company.
Richard Piez, Instructor in State Normal School, Oswego, N. Y.
Henry M. Price, with Thomas C. Basshor & Co.
Walter G. Rinicker, with Northern Central Railway, Union Station.
William A. Robertson, Superintendent Baltimore Copper Works.
Albert Rosenberg, Manufacturing Novelties.
James B. Scott, Electrical Engineer.
Walter R. Sweeney, Electrical Engineer, with Edison Electric Company.
James C. Thompson, Mechanical Department, Baltimore and Ohio Railroad Company.
Adolphus Tiemeyer, with Chicago Beef Company.
Frederick H. Wagner, Mechanical Engineer.

CLASS OF '88.

Arthur O. Babendrier, Draughtsman, Borden Car Brake Company.
Edward Binswanger, Real Estate and Insurance.

Bernard H. Brooke.
Sydney S. Bouis, Draughtsman, with Henry Brauns, Architect.
Julius Fireman, Census Department, Washington, D. C.
Thomas G. Ford, Instructor in Baltimore Polytechnic Institute.
George M. Gaither, Instructor in Baltimore Polytechnic Institute.
John H. Harvey, Machinery Department, Baltimore and Ohio Railroad Company.
Howard Harvey.
Walter J. Herrman.
Joseph H. Hooper, Commission Business.
John P. Jefferson.
William Johnston, Jr., Asheville, N. C.
William Meucke, Mechanical Department of Stieff's Piano Works.
William F. Mylander, Electrical Engineer.
Edwin F. Orem, Pattern-Maker, Baltimore, Md.
Edward B. Passano, with F. X. Hooper.
George E. Repp, with Messrs. Dunn & Co.
Harry E. Roberts, Mechanical Department of Messrs. J. F. W. Dorman & Co.
George C. Robinson, Machinist, with Messrs. James Clark & Co.
Hanson Robinson, Draughtsman, Ellicott Machine Works.
Robert E. Rodgers, Inspector Machine Department, Baltimore and Ohio Railroad.
George H. Sickel, Standard Oil Company.
Washington B. Stanton.
Orlando C. Wicks, Director Manual Training School, Moline, Ill.

CLASS OF '89.

William F. Ackerman, Draughtsman.
Samuel R. Adams, Civil Engineer, Baltimore and Ohio Railroad Company.
Morgan H. Baldwin, Cotton Mills, Baltimore County, Md.
Isaac Behrend, with Messrs. B. J. Behrend & Son, Washington, D. C.
Albert T. Barrett, Mechanical Department, Maryland Meter Works.
Rozier L. Bouis, with W. C. Newton, Washington, D. C.
Robert H. Buschman, with Buschman & Son.
Charles C. Constantine, Machinist, with Messrs. E. J. Codd & Co.
Edgar P. Cromwell, Freight Department, Baltimore and Ohio Railroad Company.
Howard Crosby.
John L. Ehrman.
Allyn Field, Office of *The Baltimore Underwriter*.
Harry M. Ford, Treasurer Ford's Opera House.

Louis H. Gerding, with Messrs. Murrill & Keizer.
Arthur Gordon, Electrical Engineer, Baxter Motor Company.
Ernest Griffith, Book-keeper, with Robert C. Griffith & Co.
John S. Hand.
Joseph Isaacs, Civil Engineer.
Claiborne M. James, Civil Engineer's Department, Baltimore and Ohio Railroad.
Albert C. Layman, with Columbian Iron Works.
Charles W. Leach, with Leach & Orem.
J. W. C. Meikle, with Messrs. Smith, Dixon & Co.
George W. Moog, deceased.
John K. Mount, with John C. Grafflin Company.
Robert W. Peach, Mechanical Department of Stieff's Piano Works.
Charles E. Phelps, Jr., Chief Engineer, Baltimore Subway Commission.
William G. Robertson.
Robert C. Round, Postoffice, Baltimore, Md.
Myron S. Rose, Mechanical Department, Navy Yard, Washington, D. C.
William C. Seigmund, Doctor Veterinary Surgery.
Joseph Steifel, with Messrs. Steifel & Cohen.
Harry P. Suman, with Messrs. Suman & Ott.
Carroll Thomas.

CLASS OF '90.

John F. Abendschein, Machinist, with F. X. Hooper & Co.
G. S. Barnes, Architect, with Charles Carson.
J. H. Bokee, Maryland Brick Company.
John E. Broadbelt, Jr., Instructor, Baltimore Polytechnic Institute.
W. H. C. Farinholt, Merchant, Bayport, Va.
Chris. Feick, with N. Y. Besent.
J. Froelich.
William P. Gundry, Instructor, Baltimore Polytechnic Institute.
E. C. Harris, deceased.
J. C. Mattoon, Instructor, Easton (Md.) High School.
John D. Pugh, Draughtsman, Engineer Corps, United States Army.
A. O. Robertson, Electrician, Wenstrom Electric Company.
* William F. Schulz, Inspector, Westinghouse Company, Wilkinsburg, Pa.
Michael D. Schaefer, Draughtsman, Steelton, Md.
William P. Shriver, Educational Director, Young Men's Christian Association.
Theodore Straus, Electrician.

CLASS OF '91.

Walter Amos, Receiving Teller, American National Bank.
Basil Benson, with People's Machine Works.
William Benson, with J. H. Medairy & Co.
William Boucsein.
Morde Bren, with Baxter Electric Motor Works.
John J. Caine, John Caine & Sons, Builders.
George Dannettel with Ries Electric Motor Works.
Charles Ehlers, with Mergenthaler's Linotype Machine Works.
Ferdinand B. Keidel, Student, Johns Hopkins.
J. Edgar Knipp, Minister, United Brethren.
Samuel McNeal, with F. X. Hooper & Co.
James C. Phillips, with Phillips Bros. & Co.
* Herbert M. Reese, Johns Hopkins.
Edmund W. Robinson, with Robert B. Womble.
Reuben Row, Draughtsman, John C. Froelich & Co.
Warren S. Seipp, Instructor, Baltimore Polytechnic Institute.
Richard S. Warner, with Boyd, Jones & Co.
William A. Young, Electrician, Baltimore Subway Commission.

CLASS OF '92.

Edwin W. Antes.
John P. Baer, Merchants' National Bank.
Frank J. Borie, Assistant Engineer, United States Navy.
B. Harrison Branch, General Electric Company, Schenectady, N. Y.
Leonard Burbank, with Consolidated Gas Company.
† William C. Butler, Jr., Traction Company, Washington, D. C.
J. W. Dawson, Jr., Draughtsman, Cramp's Ship-Yard, Philadelphia.
* Royal R. Duncan, Attorney-at-Law.
Charles R. Durling, D. E. Evans & Co., Electricians.
Isidor Deutsche, Electrical Engineer.
Walter H. Eisenbrandt, United States Revenue Marine Service.
William L. Holmes, Electrician, Oella Cotton Mills, Howard County, Maryland.
Frank B. Hooper, Construction Department, Maryland Steel Company.
Edgar N. King, Baltimore and Ohio Railroad Company.
John Langford, with Southern Electrical Company.

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* Received the Alumni Medal, having graduated with the highest general average.

† Received the Saville Steam Engineering Medal, having graduated with the highest average in Steam Engineering.

Louis Liepman, Proprietor the Novelty Plating Works.
R. M. Miller, with Young, Creighton & Diggs.
J. C. Miller, with Patapsco Rubber Company.
Joseph Mullen.
William H. Rose, Student, Cornell University.
Albert G. Singewald, Student, Cornell University.
William H. Soine, with Charles Zies, Engineer and Machinist.
William E. Straus, Student.

CLASS OF '93.

Theodore H. Ackerman, Engineering Department, Lake Drummond and Canal Water Company.
*Herbert Addison, General Superintendent Union Coal and Coke Company, Denver, Colorado.
Oregon R. Benson, Mining, Klondike.
Percy Thayer Blogg, Embosser, with Bartgis & Co.
C. Raymond Carson.
William John Cochran, with Wallace Stebbins & Sons.
E. C. D'Yarmett, Instructor, Hampden Normal School.
Henry M. Fitzhugh, Medical Student.
Clarence S. Hand, Draughtsman, with Campbell & Zell Company.
James F. McShane, Draughtsman, with Bartlett, Hayward & Co.
Clarence M. Morfit, Electrician, United States Navy.
F. H. Phelps, Real Estate Agent.
†Edwin Schenck, Electrician.
John R. Uhler, Instructor in Beaver College, Beaver, Pa.
L. Ismay Van Horn, Draughtsman, with Mann & Co.
Charles P. Weishampel, with Milliken Bros., Engineers, New York.
R. L. Williams, lost at sea, on Bourgogne, July 4, 1898.

CLASS OF '94.

Edward H. Bell, Electrician, Brooklyn, N. Y.
Albert M. Bowen, Jr., United States Express Company.
J. Straith Briscoe.
Harry Cotton, Medical Student.
Carroll Edgar, Instructor, Maryland Nautical Academy.
Frederick Kopp, Printing.

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*Received the Alumni Medal, having graduated with the highest general average.

†Received the Saville Steam Engineering Medal, having graduated with the highest average in Steam Engineering.

* Philip Littig, Jr., Electrician.
Thomas Q. McGinn.
Herbert A. McGraw, Student, Cornell University.
† Horace J. Miller, Marine Engineer.
Louis Mueller, Printer.
George M. Parlett, Draughtsman, Thos. C. Basshor & Co.
Charles Schlicker.
Alan P. Wilson, Baptist Minister.
John Zeubert, Student, Johns Hopkins University.
Pliny Cutler Hall, Hotel.
Edward J. Herring, Herring Bros., Machinists, Winston, N. C.

CLASS OF '95.

George W. Brown, with Preston, Fiddie & Co.
Clifton A. Coggins, Draughtsman, William Hollingsworth, Machinist.
Harry W. Francis, with Sumner & Francis, Straw Hat Manufacturers.
*Graham B. Hall, Bicycle Dealer.
William W. Hogendorp, Messrs. Joel Gutman & Co.
Albert J. Hooper.
Frank A. Hornig.
Howard L. Hoskins, Acetylene Gas Company.
Edward M. Likes, *Baltimore American*.
† Ward P. Littig, Student, University of Maryland, Law Department.
Alfred F. Loeser, Draughtsman, Bartlett, Hayward & Co.
Thomas J. H. Magness, Bicycle Dealer.
Herman F. Meyer, with Alexander Brown & Sons, Bankers.
George N. Rogers, Expert Accountant.
Hamilton D. Ruth.
Richard F. Weishampel.
Carl A. Witthaus, deceased.

CLASS OF '96.

Samuel Hosea Armstrong.
Howard Douglas Bennett.
James Gomalial Boss, Jr.
William Augustine Boykin, Jr.

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* Received the Saville Steam Engineering Medal, having graduated with the highest average in Steam Engineering.

† Received the Alumni Medal, having graduated with the highest general average, and the Class of '93 Electrical Medal, having graduated with the highest average in Electrical Engineering.

Robert Lemmon Burwell.
Harry Parr Diggs.
Frederick Ludwig Henry Glendmeyer.
William Howard Hamilton.
Arthur Worthington Hawks, Jr., Reporter Baltimore *Herald.*
Louis Kemp Hennighausen.
Harry Louis Homer, Student.
*Ludford Cohoon Jones, Machinist U. S. Navy.
Leon Alvyn Kohn.
Erich Albert Loeser.
†Henry Louis Mencken, with Aug. Mencken & Bro., Cigar Manufacturers.
‡Harold Vincent Patterson.
Harry Clay Powell, Jr.
Gilmor Meredith Ross.
Thomas Quincy Scott.
°Henry Bonn Silverthorn, Colonel Sinn's Montauk Theatre, Brooklyn, N. Y.
William Henry Smith.
Frederick Worthington von Stein.
Roscoe Conkling Sweeny.
Charles Edwin Wilson.
Olin Alexander Wilson, Instructor Easton (Md.) High School.

CLASS OF '97.

Louis Fabian Bachrach.
§Alan Marion Bennett, with C. Howland Sherman, Marine Engineer, Washington, D. C.
‖William Melvin Carter.
Elvin Griswold Cromwell.
John Towson Elsroad, Jr., Telegraph Operator.
John Montgomery Gambrill, Principal Ellicott City (Md.) High School.

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*Received the German Medal, having graduated with the highest average in German.

†Received the Alumni Medal, having graduated with the highest general average.

‡Received the Saville Steam Engineering Medal, having graduated with the highest average in Steam Engineering.

°Received the Class of '93 Electric Medal, having graduated with the highest average in Electrical Engineering.

§Received the Class of '93 Electrical Medal, having graduated with the highest average in Electrical Engineering. Received also the German Medal, having graduated with the highest average in German.

‖Received the Alumni Medal, having graduated with the highest general average. Received also the Class of '96 Mathematical Medal, having graduated with the highest average in Mathematics.

Ernest Cummins Hatch, Student.
*William Hain Kirwan, Electrician U. S. S. *Dixie*.
Harry L. Kugler, with E. G. Hipsley & Co.
Chester Waters Larner, Standard Oil Co.
Howard Osgood Preston, with Messrs. Murrill & Keiser.
George Gottlieb Schnepfe.
Frederick Lewis Schwartz.
Joseph Stewart Smith, Jr.
Douglas Alan Sparks.
Joseph Morrison Sparks.
Wilson Ward.

CLASS OF '98.

† Thomas Jefferson Andrews, Draughtsman, B. & O. R. R., Wilmington, Del.
Alan Joseph Bachrach, with Messrs. Bachrach Bros.
‡ Leo Bauersfeld, with McCay-Howard Co., Electrical Engineers.
Wilbur McKew Bosworth, Mount Clare, B. & O. R. R.
Frederick Derick Dollenberg, Jr., with Standard Oil Company.
Romulus Griffith Doyle, with Matthai, Ingram & Co.
John Howard Flayhart, Draughtsman, Snowden & Cowman.
Henry Galloway, with McCay-Howard Co., Electrical Engineers.
Charles Raymond Gantz, with Geo. C. Gantz & Son.
Samuel Thomas Griffith, with Messrs. Falaferro & Thomas, Insurance Agents.
§ Alfred Cummins Hatch, Book-keeper, Towson National Bank.
William Herman Hubers, Jr.
Joseph Lowrie Ingle, Jr., Student.
John Scott Longnecker.
John Walter McGreevy.
Edward Harris Mealy, with Messrs. Hennegen & Bates, Jewelers.
William Charles Metcalf, with Pennsylvania R. R.
John Floyd Miller, with D. Holliday & Co.
William Eldred Nolan, Draughtsman.

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*Received the Saville Steam Engineering Medal, having graduated with the highest average in Steam Engineering.

† Received the Alumni Medal, having graduated with the highest general average. Received also the Class of '96 Mathematical Medal, having graduated with the highest average in Mathematics.

‡ Received the Saville Steam Engineering Medal, having graduated with the highest average in Steam Engineering.

§ Received the German Medal, having graduated with the highest average in German.

Gurdon Tyler Pollard, Draughtsman, with Bartlett & Hayward.
Walter Percy Poole.
John Maurice Rehberger, Student.
John McCullough Rife, Draughtsman, Crown Cork and Seal Company.
* Harry Rufus Ruse.
Paul Edward Schaun, Student.
John Henry Sirich, Jr., with Messrs. Poole & Hunt.
John Smith, Student.
Herbert Turner Snyder, Student.
George Creamer Wilcox, B. & O.

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* Received the Class of '93 Electric Medal, having graduated with the highest average in Electrical Engineering.

POST GRADUATES.

William Felter Ackerman, '89.
William Henry Soine, '92.

PREPARATORY DEPARTMENT.

Composed of boys from the sixth, seventh and eighth grades of grammar and English-German schools, and those who pass a satisfactory examination in the following subjects:

1. *Arithmetic*—Through United States Money. Common fractions, decimals and compound numbers.
2. *Geography*—Easy questions on United States and South America.
3. *Language*—Spelling ordinary words. Distinguishing parts of speech and using them correctly in sentences.

TEXT-BOOKS.

Arithmetic—Hobbs' Academic.
Algebra—Ray's Higher and Elementary.
Wentworth's School.
Wentworth's First Steps.
Book-keeping—Montgomery's Modern.
Geometry—Wentworth's.
Geography—Appleton's Standard.
Frye's Complete.
Grammar—Sheldon's Language Lessons.
Whitney and Lockwood's.
History—Eggleston's United States.
Physiology—Dulany's Standard.
Martin's Human Body.
Reader—Newell's Sixth.
Newell's Fifth.
Swinton's Fifth.
Wood-worker—Sickel's.
Metal-worker—Jones.

SCHEDULE OF STUDIES OF PREPARATORY DEPARTMENT.

SIXTH GRADE.

Language—Spelling, oral and written exercises; compositions, including original productions, reproductions and abstracts of lessons in reading, geography and history; studies of simple sentences; parts of speech distinguished and their office; the gender, person, number and cases of nouns and pronouns; the comparison of adjectives and adverbs.

Reading—Swinton's Fifth Reader. Supplementary Reading.

Writing—One writing book each half year; copy short letters or notes.

Arithmetic—Thorough review of decimal and common fractions. Denominate numbers, with practical problems involving the principles of surface measurements—painting, plastering, carpeting, etc.; also problems in cubical contents—reservoirs, bins, etc. "Work problems." Longitude and Time.

Algebra—Definitions, examples in numerical value, verification of numerical equations, addition, subtraction, removal of parentheses, placing quantities within parentheses, multiplication, division, miscellaneous examples involving the operations of the four fundamental rules, and the solution of numerical integral equations.

Mensuration—The solution of problems involving of lines, surfaces and volumes.

Geography—Higher; Southern States, Central and North Central States; Europe.

History—Eggleston's History of the United States to Chapter 23.

Science—Dulany's Physiology.

Drawing—Forty-five minutes each day; sketching from models; free-hand drawing; maps of Maryland and the United States.

Wood-work—Sixty minutes each day for twenty weeks; care and use of tools; make ten lessons.

Sheet Metal Work—Sixty minutes each day for twenty weeks; care and use of tools and charcoal furnace; make ten lessons.

SECOND YEAR—SEVENTH GRADE.

Language—Oral and written exercises; work of the preceding year continued; compositions, including abstracts of lessons in reading, geography and history, social and business letters. Properties of the parts of speech completed—voice, mode, tense and the use of auxiliaries; analysis and study of easy complex and compound sentences; principles of syntax illustrated by familiar examples; punctuation.

Reading—Newell's Fifth Reader; History of the United States; spelling; supplementary reading; compositions and other written exercises; recitation of appropriate selections.

Writing—One writing book each half year; copying bills; writing in blank books valuable extracts, compositions and reproductions.

Arithmetic—Percentage:

(*a*) Profit and loss, and commercial discount.
(*b*) Interest—simple, annual and compound.
(*c*) Partial payments—United States and Mercantile Rules.
(*d*) True and bank discount.

Ratio and proportion—simple and compound.
Partitive proportion, simple and compound partnership, and alligation.

Mensuration—Drill in finding surface and contents of the following figures:

Triangle, trapezoid, trapezium, circle, cylinder, cone, prism, pyramid. Practical problems are worked, the student being taught how to compute the cost and quantity of material used in the various lessons made in the shops.

History—Eggleston's History of the United States to Chapter 37; reviewing first year's work.

Science—Martin's Human Body, by Dulany. First half to Circulation.

Geography—Rocky Mountain and Pacific States; Europe reviewed; Africa; maps of Maryland and Africa.

Algebra—A review of the first year's work, instruction in the various methods of factoring, finding the L. C. M. and the G. C. D. by the factoring method, fractions, solution of equations involving one, two, three or more unknown quantities and problems depending upon them. Particular attention is given to factoring.

Drawing—Forty minutes each day. Free-hand and maps.

Wood-work—Sixty minutes each day for twenty weeks; care and use of tools; make ten lessons.

Metal Work—Sixty minutes each day for twenty weeks.

THIRD YEAR—EIGHTH GRADE.

Reading—Newell's Sixth Reader. Supplementary Reading, including Civics, Constitution of United States, and pupils' selections from leading authors.

Spelling—From lessons in reading.

Writing—Two books per year. Vertical System.

Composition—Instruction is given in the accumulation of materials and the arrangement of matter, diction, formation of sentences and paragraphs, punctuation and the use of capitals.

Grammar—A review of the grammatical principles previously taught; and a careful study of the structure, analysis, and uses of sentences. Particular attention is paid to the correct use of the different parts of speech.

Book-keeping—The completion of several sets in single entry, combined with the practice in writing notes, drafts, bills, orders, etc.

Arithmetic—A thorough review of the work previously taught, in conjunction with the study of commission, insurance, taxes, duties, equation of payments, average of accounts, involution and evolution, and series.

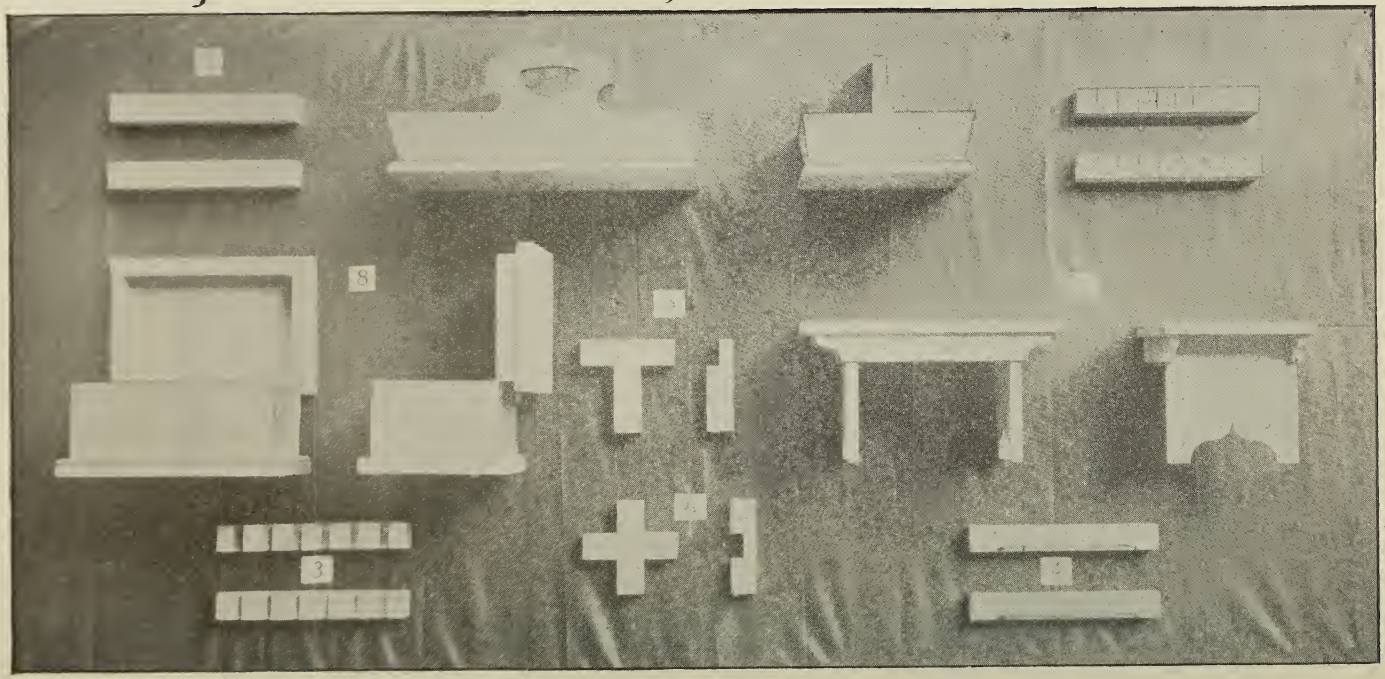
Algebra—Wentworth's—Exercises in generalization, discussion of simple equations, involution, evolution, radicals, inequalities and quadratics.

Mensuration—Solution of problems based on the lessons that have been made in the shops.

Geometry—Wentworth's—The first two books, as far as measurement of angles, consisting of definitions, straight lines, angles, triangles, polygons, and the circle.

Geography—Asia, Oceania and Maryland. Review of Mathematical and Physical Geography.

Physiology—Martin's Human Body from Circulation to Nervous System.



LESSONS IN CARPENTRY—SIXTH GRADE.

FREEHAND DRAWING.

The course covers three years (four hours per week for forty weeks), for the sixth, seventh and eighth grades, *consecutively*, classed under the heads of Construction, Decoration and Representation, as follows:

Construction—Beginning with simple geometrical models the pupil is gradually advanced until complete working drawings (for each respective grade in both wood and metal shops) are made.

Decoration—Origin of ornament, its use and application, in borders, rosettes and surface coverings. Study of Historic examples. Original application. Color.

Representation—Sketching from "type forms" and objects based on them in outline, and light and shade, with pencil. Casts, etc., in charcoal and crayon. Maps. Perspective.

WOOD-WORK.

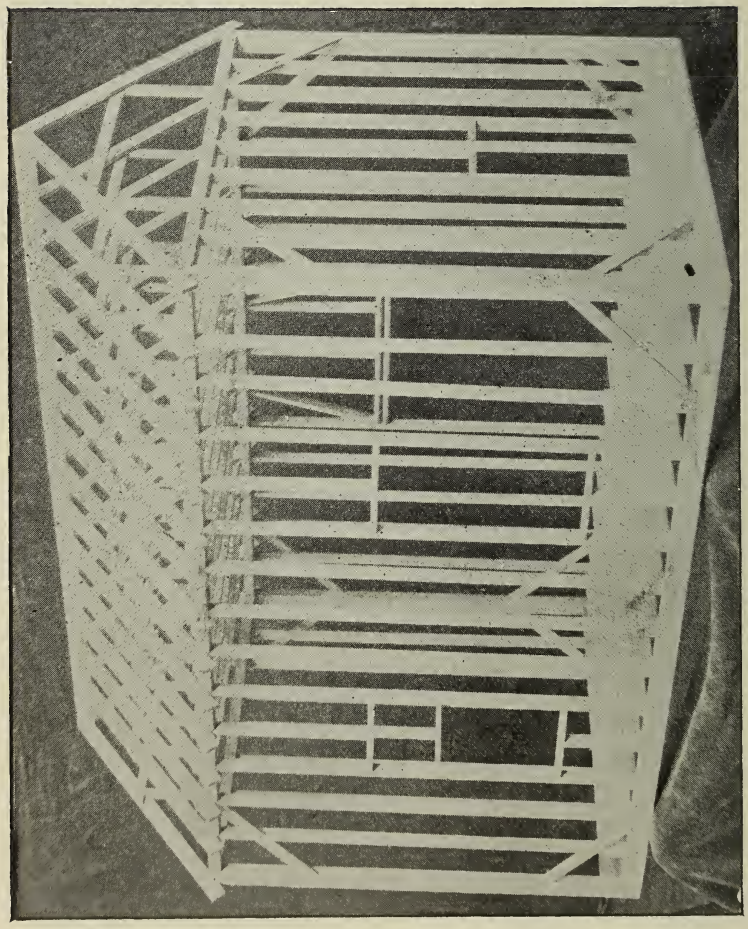
FIRST YEAR—SIXTH GRADE.

One Hour and Forty Minutes Twice Each Week. Twenty Weeks.

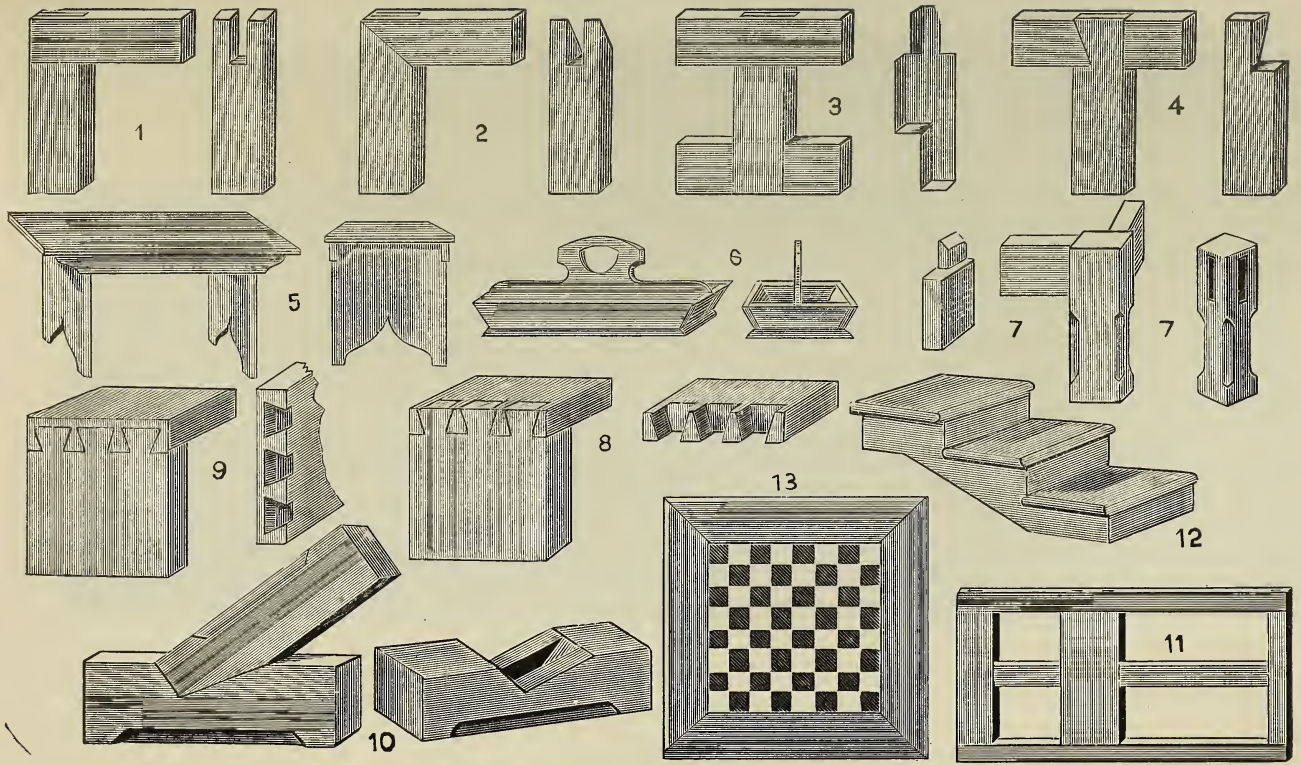
The course in carpentry of the sixth grade embraces the following exercises:

1. Square prism.
2. Saw kerfiing.
3. Trenching.
4. Chamfering.
5. Centre half lap joint.
6. Notch joint.
7. Stool.
8. Plain nailed box.
9. Knife box.

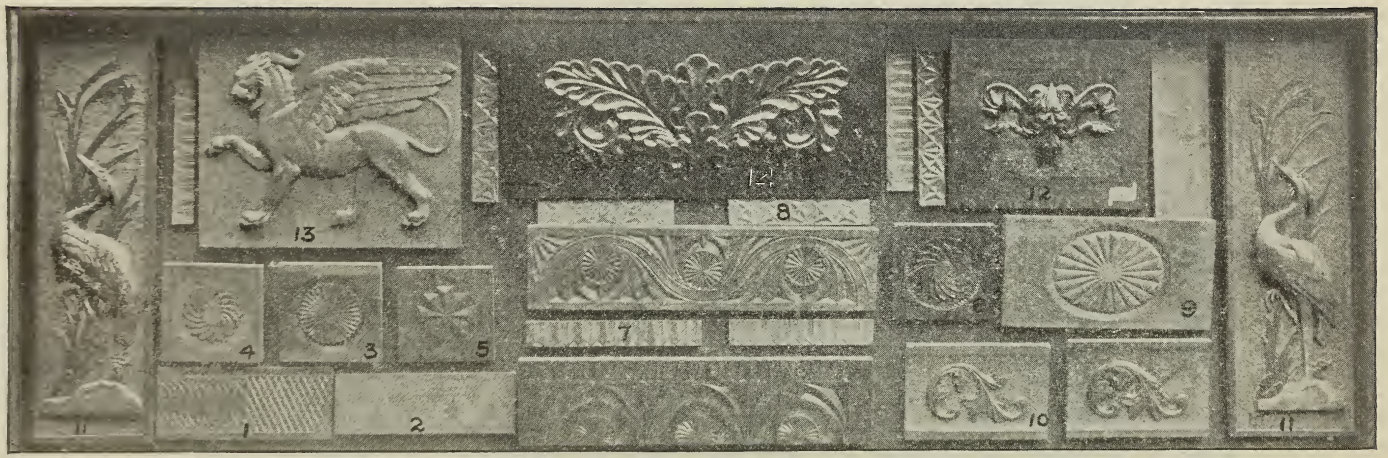
In addition to the bench exercises they have lectures on the structure and composition of wood; age, decay and season for cutting wood; warping properties, defects and measure and value of wood, and the care and use of tools.



CARPENTRY—SECOND YEAR—SEVENTH GRADE.



CARPENTRY—SECOND YEAR—SEVENTH GRADE.



LESSONS IN CARVING—EIGHTH GRADE.

SECOND YEAR—SEVENTH GRADE.

One Hour and Forty Minutes Twice Each Week. Twenty Weeks.

Care and use of tools.

1. Open mortise and tenon, 1¼x1¼x4 inches.
2. Mitre mortise and tenon, 1¼x1¼x4 inches.
3. Combination—half lap and mortise-and-tenon joint.
4. Half lap dovetail joint.
5. Stool—12x7x6 inches.
6. Knife box, 14x8x2¼ inches.
7. Table leg joint.
8. Dovetail joint.
9. Half-blind dovetail joint.
10. Brace mortise and tenon.
11. Door frame.
12. Stairs—carriages, risers and treads.
13. Checker board.

EIGHTH GRADE—THIRD YEAR.

Preparatory course in carving. Embraces:

Care and use of carving tools.
Properties of woods best fitted for carving.
Surface carving.
Incised carving.
Relief carving.
Panels, mouldings, and perforated carvings.
Methods of finishing and staining.

SHEET METAL WORK—FIRST YEAR—SIXTH GRADE.

REPOUSSE WORK—SECOND YEAR—SEVENTH GRADE.

SHEET METAL WORK.

FIRST YEAR—SIXTH GRADE.

Sixty Minutes Each Day. Twenty Weeks.

The course of instruction pursued is as follows, viz.: Study of the metals and their alloys; the care and use of tools; how to make and care for the fire in a charcoal furnace; gas-heating furnace; how to lay off the work; the composition and requirements of solder. Fluxes used in soft soldering.

The following practical lessons are given:

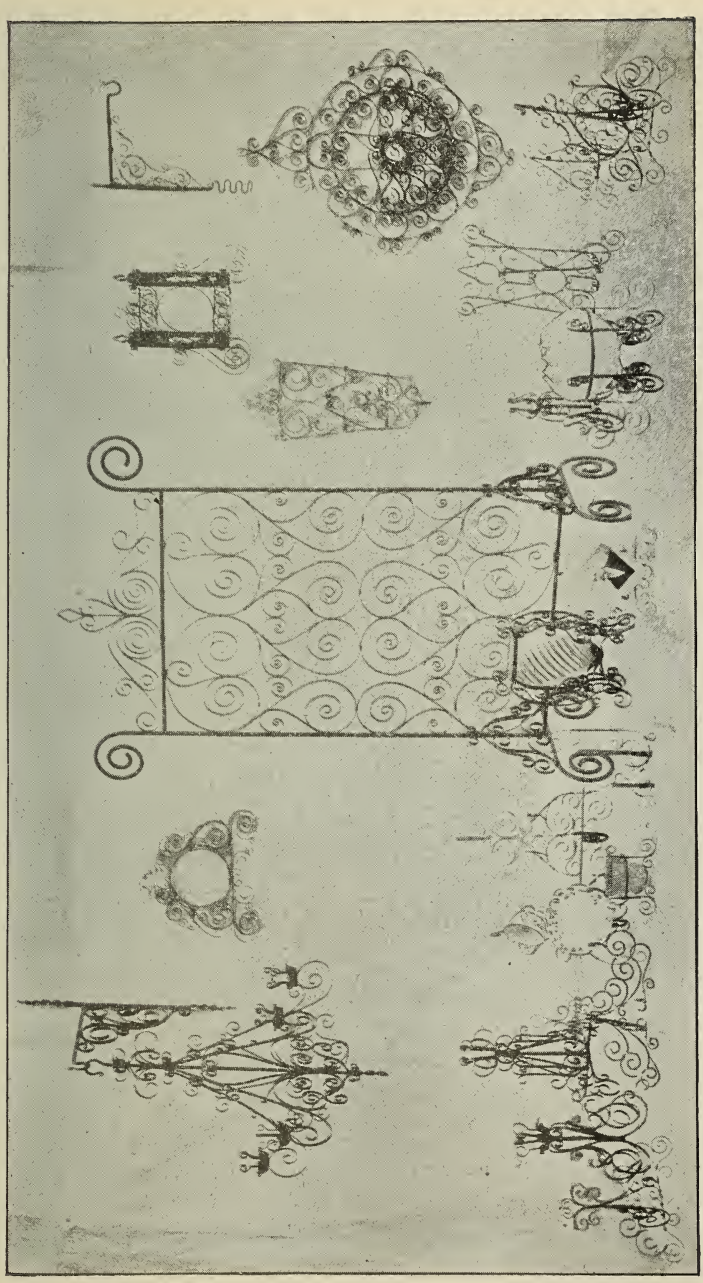
1. Solder two pieces of tin together.
2. Groove and solder a seam.
3. Rivet two pieces of tin together.
4. Exercise in wiring and rolling.
5. Plain pipe, 6 inches long, 2 inches diameter.
6. Square pipe, 6 inches long, 2 inches square.
7. Tin cup.
8. Rectangle pan, 4x8x1½ inches deep.
9. Funnel.
10. Plain kettle.
11. Elbow right and obtuse angle, 6x6x2 inches deep.
12. Round pan, 4 and 5 inches diameter, 1½ inch deep.
13. Coffee pot, 3½ inches diameter, 6 inches deep.
14. Butter kettle, 8x5x5 inches.
15. Sprinkling can.
16. Milk can.

SHEET METAL WORK.

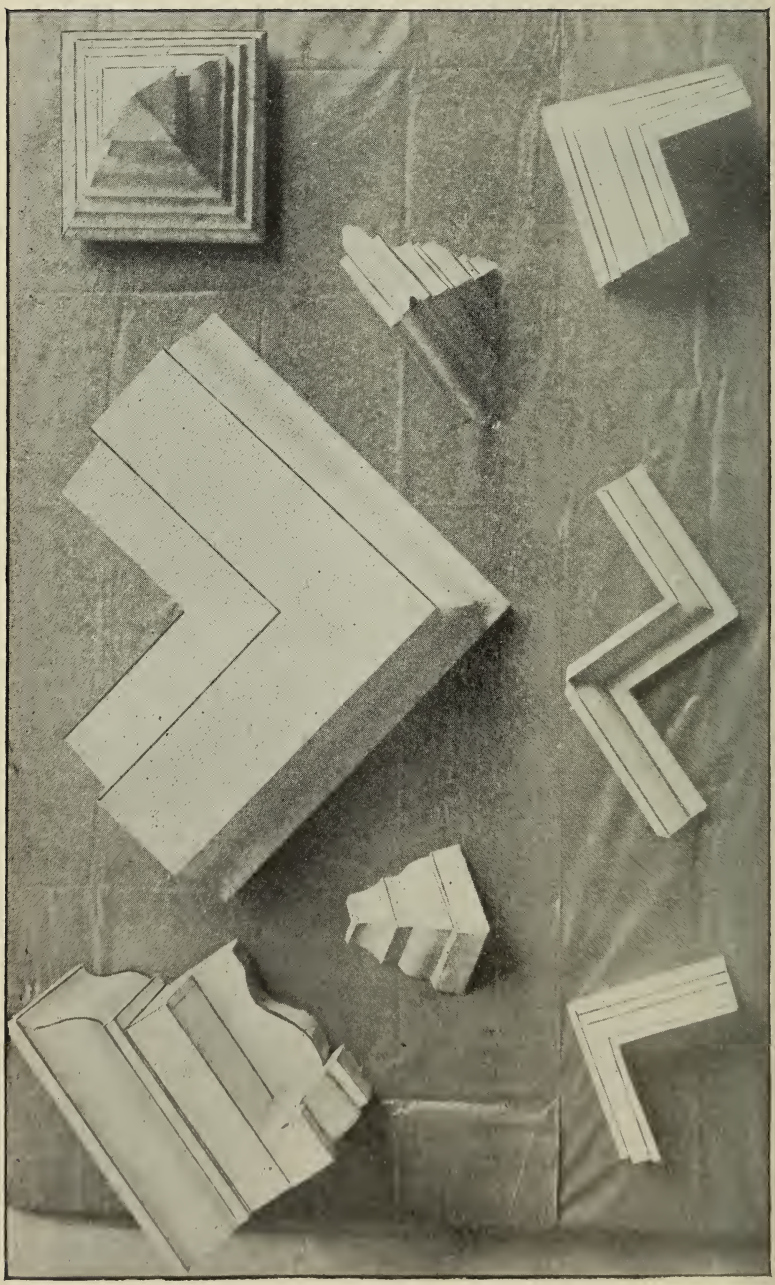
SECOND YEAR—SEVENTH GRADE.

Sixty Minutes Each Day. Twenty Weeks.

Review of the work of the first year; drawing and laying of the work designed by each student for practical lessons; brazing and annealing. The management of a gasoline and mouth blow pipes, and the



IRON WORK—THIRD YEAR—EIGHTH GRADE.



CORNICE MITRE—THIRD YEAR—EIGHTH GRADE.

study of the various metals, with lectures thereon; also upon the work and tools generally. The practical lessons are:

Soldering and brazing.
Pattern-cutting.
Repousse work in Tin, Zinc, Copper and Brass.
Forming designs in Venetian Iron.

SHEET METAL WORK.

THIRD YEAR—EIGHTH GRADE.

Twenty Weeks.

For those who have completed the first and second year course, the principal instruction given is the drawing, laying off, and forming cornice mitres.

For others:

Brazing copper pipe seam.
Copper pan, made of one piece.
Advanced work in repousse.
And an original design in Copper, Tin and Brass.

NAMES OF STUDENTS.

PREPARATORY DEPARTMENT.

FIRST YEAR.

SIXTH GRADE—FIRST SECTION.

Alldridge, Harry L.....604 West Lee street.
Bensel, J. Harry.....2126 East Monument street.
Biedler, F. Wilbur.....1708 St. Paul street.
Byers, Davis T.....1800 North Caroline street.
Caple, Walter J.....1144 North Carrollton avenue.
Chaims, Lawrence M.....246 South Broadway.
Crawford, William W.....1822 North Caroline street.
Dorsey, John W., Jr.....407 North Charles street.
Giampaoli, Joseph.....510 President street.
Goodwin, Thomas H.....810 North Carey street.
Gross, Frederick G.....1818 North Chester street.
Johnson, Clarence E.....134 Gittings street.
Katz, Jacob.....1525 East Pratt street.
Kershaw, James B.....755 Third avenue.
Kohlhepp, Harry S.....1001 Linden avenue.
Kohlhepp, Joseph W.....1001 Linden avenue.
Lang, John J.....904 East Madison street.
Liedlich, Harry C.....1444 N. Carey street.
Luers, George A.....Bowie, Prince George's county, Md.
Mertel, Michael J.....1920 Gough street.
Ogilvie, Thomas R.....831 W. Cross street.
Oldewurtel, John.....505 South Broadway.
Pearson, Solon T.....410 North Gilmor street.
Phipps, George M.....838 Harlem avenue.
Reed, J. Frank.....1617½ Ashland avenue.
Rettaliata, Charles.....104 Mt. Royal avenue.
Rettaliata, Valerio.....104 Mt. Royal avenue.

Reynolds, Bernard I.....1715 Druid Hill avenue.
Robinson, Herbert V.....1309 Linden avenue.
Schroeder, J. Harry.....1620 East Federal street.
Scott, B. Howard.....312 East North avenue.
Shockney, W. Stephen.....731 Cumberland street.
Taylor, Danie E.....1032 North Stricker street.
Thomas, John.....643 W. Lombard street.
Vaeth, Frederick.....1108 Leadenhall street.
Valentini, Joseph.....1002 East Pratt street.
Walker, Frederick C.....2419 East Townsend street.
Ware, C. Carroll.....218 West Huntingdon avenue.
Watts, Frank W.....801 North Calvert street.

SIXTH GRADE—SECOND SECTION.

Benseler, Ernest A.....10 Garrison lane.
Bladin, C. Eric.....507 North Fremont avenue.
Bonsal, Charles W.....1829 Montrose street.
Clark, Robert A.....26 North Caroline street.
Davis, Howard E.....Rose Hill, Waverly.
Duvall, Samuel T.....809 North Fremont avenue.
Eckert, William.....2533 West Lexington street.
Edel, Charles A.....1641 West Lanvale street.
Ennis, Howard W.....1118 North Fulton avenue.
Feige, John H. P.....413 North High street.
Gleitsman, William H. F.....918 Pennsylvania avenue.
Goetze, William L.....1036 Hopkins avenue
Harp, Edward Lawrence.....302 South Chester street.
Heller, Fred. B.....908 West Lexington street.
Hess, William E.....716 East Biddle street.
Hill, J. Norman.....819 North Washington street.
Johnston, James G.....909 Ridgeley street.
Jones, Whitney Wallace.....801 William street.
Lyon, William T.....1707 Edmondson avenue.
McBee, Jesse W.....707 East Chase street.
Mabbett, Joseph Edwin.....2022 Mount Royal Terrace.
Marmour, Leon.....1812 McCulloh street.
Miller, George F.....1 Oakdale avenue.
Mill, Irving Elwood.....235 Carroll street.
Parker, Henry H.....623 North Mount street.
Parsons, Sidney H.....1033 North Eutaw street.
Sargent, Edward B.....1721 East Preston street.
Solomon, Otto.....2120 East Monument street.

Storm, Bayard..... 506 North Calvert street.
Tall, Richard S..... 515 West Lee street.
Taylor, Joseph A.....1703 East Lanvale street.
Walsh, Aloysius S.....649 North Paca street.
Webb, M. Leslie..... 618 West Franklin street.
Wenchel, Lawrence, Jr..... 521 North Wolfe street.
West, Frank H..... .....201 North Carey street.
Yingling, Frank S..... .....555 Presstman street.

SIXTH GRADE—THIRD SECTION.

Bamberger, George..... .....1314 Greenmount avenue.
Bamberger, Thomas.....1314 Greenmount avenue.
Barton, Charles H., Jr .....Corner Parkdale and Woodberry avenues.
Bateman, Frank C.....924 Madison avenue.
Bemis, Earl A..... .....902 Madison avenue.
Brown, Thomas C..... .....755 West Fayette street.
Cadell, William..... 115 Milton avenue.
Childs, George M.....1003 Oliver street.
Connolly, James E.....1116 North Eutaw street.
Crocket, William H.....33 East Henrietta street.
Crowley, Stuart.....1516 Mulberry street.
Cummings, Hershey S.....1221 McCulloh street.
Euler, August.....1031 Pennsylvania avenue.
Fritz, Emanuel..... .....117 Pearl street.
Gough, William J.....1721 Guilford avenue.
Hehthcote, Paul.....626 Pitcher street.
Hebb, Joseph S..... .....824 East North avenue.
Hewitt, Harry.....1316 Wilcox street.
Holms, Raymond..... ....321 North Fulton avenue.
Kalb, John.....1143 Columbia avenue.
Kavanagh, Hugh..... ....407 East Madison street.
Lyons, E. Bayley.....2420 Druid Hill avenue.
Mitchell, William O..... .....Lauraville, Md.
Morgan, Harlan W.....1413 West Lafayette avenue.
Noris, Millard C..... .....1004 Greenmount avenue.
Porter, David.....1124 Linden avenue.
Pyle, Frank J..... .....1102 Leadenhall street.
Radcliff, Samuel H..... .....1517 East Hoffman street.
Richardson, Harry L.....Laurel, Del.
Robinson, Millard F..... ...1232 East North avenue.
Rogers, Walter..... .....927 Linden avenue.
Rogers, Howell..... ..... 1511 Presstman street.

Schroeter, Eric.....2502 Woodbrook avenue.
Schultheis, Charles.....1553 Newington Place.
Steffey, Harold.....2541 West North avenue.
Thomas, Harry C.....633 North Carrollton avenue.
Thomas, LeRoy.....5 East Pleasant street.
Warnsman, Edward M.....1512 North Broadway.
Weitzel, William M.....1032 McDonough street.
Williams, Harry.....1624 West Mulberry street.

SECOND YEAR.

SEVENTH GRADE—FIRST SECTION.

Blakesley, Delbert E.....1418 North Bond street.
Boyc, J. Albert.....1802 Bolton street.
Brent, Raleigh C.....1523 Linden street.
Brittingham, Henry C.....930 Harlem avenue.
Brown, A. Carroll.....122 West Twenty-fourth street.
Brown, Harry B.....122 West Twenty-fourth street.
Czarnowsky, Herbert F.....1513 Riggs avenue.
Darby, Walter C.....2018 North Charles street.
Desch, John M. J.....1427 North Charles street.
Ford, Ulysses S.....2425 East Preston street.
Fusselbaugh, Leston P.....422 North Gay street.
Giese, Richard S.....Wynoak avenue, Waverly.
Goodwin, John G.....407 North Calvert street.
Gross, John H.....1517 East Chase street.
Heighe, Frederick C.....834 Park avenue.
Heighe, Robert H.....834 Park avenue.
Herring, Edward.....1721 West Lombard street.
Herth, Charles E.....1015 Ridgely street.
Hinman, Frank L.....1600 St. Paul street.
Hitchcock, Brooke B.....1008 Clifton Place.
Jackson, William R.....626 North Carey street.
Knable, William E.....507 Roberts street.
Knieling, Louis J.....1541 North Bond street.
Linthicum, Asa S.....402 North Carrollton avenue.
Mackall, Colin M.....127 West Mount Royal avenue.
Marck, Allen L.....658 Pitcher street.
Northam, Manly P.....2135 Jefferson street.
Orth, Grover C.....1216 Ashland avenue.
Padgett, Robert G.....1621 North Broadway.
Penniman, Harry Y.....Mount Washington, Md.
Quigley, Edward E.....314 North Pine street.
Reid, McDonnell.....1928 Mount Royal avenue.

Rossmarck, George J.....1930 Druid Hill avenue.
Selden, William A.....137 West Mount Royal avenue.
Smith, Horace T.....1906 Bolton street.
Switzer, Daniel A.....1808 North Durham street.

SEVENTH GRADE—SECOND SECTION.

Banner, Maurice L.....1517 Riggs avenue.
Benson, Percy.....1328 Druid Hill avenue.
Brannan, Harry N.....330 Falls road.
Cavey, Edward N.....1214 West Lombard street.
Cockey, Vinton D.....2029 North Calvert street.
Collins, George C.....640 Constitution street.
Dengler, Joseph G.....1718 Canton avenue.
Eckhardt, Harry V.....822 East North avenue.
Gavan, J. Howard.....718 West North avenue.
Greene, Frank A.....2308 East Baltimore street.
Groverman, Arthur.....Ellicott City, Md.
Hanselman, Carl.....1836 East Monument street.
Hartman, James H.....810 North Fremont street.
Johnston, Frank A.....Ilchester, Md.
Krantz, Theodore E.....403 North Calhoun street.
Lally, James J.....623 North Paca street.
Luard, William S.....1203 East Chase street.
Matthews, C. Leigh.....1925 Park avenue.
Meisenhalter, Frank T.....2030 North Washington street.
Menchen, Arthur.....2827 St. Paul street.
Miller, Frank W.....1 Oakdale avenue.
Roberts, Raymond.....27 Patterson Park avenue.
Saur, August G.....219 Collington avenue.
Sackerman, Louis F.....2007 East Oliver street.
Schweitzer, John W.....1813 Hanover street.
Soine, Carl A.....2809 North Walbrook avenue.
Stewart, Edwin.....30 Cottage avenue.
Stiemke, Martin L.....27 South Caroline street.
Tall, Edward R.....224 Warren avenue.
Thompson, William.....2200 North Caroline street.
Tyler, Edgar F.....12 East Twenty-fourth street.
Waterman, Albert A.....1710 Madison avenue.
Waterman, Sylvan L.....1710 Madison avenue.
Wolfsheimer, Arthur.....1716 McCulloh street.

SEVENTH GRADE—THIRD SECTION.

Aylmer, Albert R.....Windsor avenue, Walbrook.
Armiger, Elmer.....823 South Charles street.
Baehman, Ernest.....202 South Patterson Park avenue.
Boeckel, William J.....1809 Frederick avenue.
Boehme, Frederick W.....1020 North Bond street.
Bouis, Gwynne P.....207 North Poppleton street.
Burton, Franklin B.....662 Pitcher street.
Caltrider, Russell J.....407 Falls road.
Dabrasky, August.....1816 West Pratt street.
Dawson, William E.....321 Girard avenue.
Ephraim, Frank J.....1324 Druid Hill avenue.
Fossett, Charles A.....2213 Eutaw Place.
Gerhold, Harry.....922 Greenmount avenue.
Goodhand, James F.....349 North Calvert street.
Gross, Milton H.....Rossville, Baltimore county.
Hamburger, Lehman H.....1603 Madison avenue.
Hammar, William B.....822 North Gay street.
Hammond, Clarence.....Brooklyn, Anne Arundel county.
Hoerr, John P.....1803 East Fayette street.
Hooper, Thomas S.....1425 Linden avenue.
Howard, Arnold E.....1020 Linden avenue.
Kraus, Henry J.....2223 East McElderry street.
Kuhn, Joseph R.....Poplar Springs, Howard county.
McIntire, Charles A.....1724 North Calhoun street.
Mason, Harry M., Jr.....229 West Lafayette avenue.
Meyers, George A.....8 South Arlington avenue.
Miller, George T.....Walbrook avenue and Eleventh street.
Niles, Hezekiah.....428 East North avenue.
Rebbel, William L.....1705 East Federal street.
Regen, Thomas J.....126 Richmond street.
Rutledge, Harry A.....1006 North Broadway.
Rust, William C.....610 West Baltimore street.
Schultz, Howard I.....646 Mosher street.

SEVENTH GRADE—FOURTH SECTION.

Backhaus, Paul.....702 West Baltimore street.
Blake, William E.....7 East Henrietta street.
Born, Otto C.....1401 North Broadway.
Bowie, Donald McA.....2136 Oak street.
Callahan, Richard A.....343 North street.
Collmus, Solomon.....913 East Madison street.

Cox, William B.....1433 West Lombard street.
Doyle, John B., Jr.....1712 Bolton street.
Dunn, Grover J.....885 West Lombard street.
Euler, Philip.....1031 Pennsylvania avenue.
Fountain, Charles A.....1403 Lanvale street.
Frank, Christian.....1025 South Sharp street.
Gadd, Thomas J.....1717 Hanover street.
Grove, Oscar C.....1231 Pennsylvania avenue.
Hartshorn, Charles E.....1322 West North avenue.
Hess, John A.....129 West Hill street.
Kammer, Robert F.....729 Columbia avenue.
Kraemer, Milton.....225 Clay street.
Krausser, John G.....334 South Smallwood street.
Krausz, Edward A.....115 West Hamburg street.
Lamb, John A.....407 St. Paul street.
Leonard, John M.....303 Montebello avenue.
Miller, John E.....23 East West street.
Petz, John A.....1406 Myrtle avenue.
Pue, Richard B.....428 North Carey street.
Pyle, Harry O.....801 First avenue, Woodberry.
Rahn, Claude J.....1228 North Stricker street.
Reynolds, Martin J.....1034 Hillen street.
Roe, Charles C.....2109 Hollins street.
Schildwacter, Otto.....1839 Pennsylvania avenue.
Schussele, John C.....1903 East Pratt street.
Shafer, Archibald R.....2138 Oak street.
Sondheim, Jack S.....1829 Bolton street.
Sondheim, Sidney S.....1829 Bolton street.
Specknall, Norval H.....Catonsville.
Stump, Walter O.....2505 West Lexington street.
Wells, Elmer.....539 Presstman street.
Wieneke, Charles A.....Park Heights avenue.

THIRD YEAR.

EIGHTH GRADE—FIRST SECTION.

Abercrombie, R. Fulton.....827 North Eutaw street.
Addison, Taylor, Jr.....32 East Henrietta street.
Ahrens, Nathan.....754 North Eutaw street.
Bladin, J. Harry.....507 North Fremont street.
Bouis, M. Dwight.....207 North Poppleton street.
Carson, David, Jr.....2030 Druid Hill avenue.
Collins, John J., Jr.....640 Constitution street.

Cooksey, R. Mavin.....1626 John street.
Cremer, August.....1801 North Gay street.
Crowther, Gwynn.....1503 Linden avenue.
Cumming, J. Pearce.....1221 McCulloh street.
Dall, Robert, Jr.....615 West Barre street.
De Baufre, William L.....1409 Pennsylvania avenue.
Dettelback, Philip.....1921 Druid Hill avenue.
Fitzgerald, Allan D.....1445 Riverside avenue.
Foster, Benjamin F.....613 West Barre street.
Freeman, Edward W.....2548 Druid Hill avenue.
Georgii, Frederick A.....1014 South Charles street.
Gieske, Walter M.....Catonsville.
Goodwin, Thomas C.....407 North Calvert street.
Hastings, Edgar M.....Lutherville, Md.
Koebrich, Charles C.....224 South Eden street.
Mermet, Emile A. B.....824 North Howard street.
Mitchell, Edward H.....995 Frederick avenue, extended.
Norris, Herbert A.....1716 West Lafayette avenue.
Popplein, John T.....Reisterstown, Md.
Prechtel, Otto.....1707 Caroline street.
Roberts, Nelson F.....Grange P. O., Md.
Roe, Charles F.....Forest Hill, Md.
Steeger, George A.....114 North Greene street.
Taylor, Frank H.....1106 Hopkins avenue.
Tinker, C. Harry.....1740 East Baltimore street.
Whiteside, H. Milton.....2426 North Calvert street.
West, George W.....923 Hanover street.
Williams, Walter W.....2011 East Chase street.
Wilson, H. Bertram.....Catonsville.
Wolfsheimer, Edward.....1716 McCulloh street.
Yardley, Charles F.....1916 Park avenue.
Zipp, B. Franklin.....1411 East Madison street.

EIGHTH GRADE—SECOND SECTION.

Bachrach, Arthur M.....1104 Madison avenue.
Benser, Grover.....134 West Hill street.
Berney, Bertram S.....1621 Madison avenue.
Cohen, Malvin S.....1629 Madison avenue.
Conlyn, T. Bryce.....139 Mt. Royal avenue.
Davidson, D. Paul.....2301 Bolton avenue.
Davis, Franklin D.....1728 Park avenue.
Dinneen, John H., Jr.....931 North Calvert street.

Dinneen, Matthew H.....931 North Calvert street.
Eigenbrot, J. Lewis .....49 Wilkins street.
Goldberg, Thomas D.....1249 East Lexington street.
Gross, John H.....1818 North Chester street.
Gunther, Henry C.....654 West Lee street.
Lamble, Frank D.....1944 Linden avenue.
Lautenbach, Ferd., Jr.....500 North Fremont street.
Layman, H. Quimby.....1131 North Carey street.
Lewis, James H.....1907 Bank street.
Linthicum, Joseph B.....402 North Carrollton avenue.
Lyon, Moncure N.....Mt. Wilson, Baltimore county.
Marriott, Thomas M.....1908 White street.
Masterman, Charles J.....715 North Fremont street.
Merz, James C.....11 South Ann street.
Miller, Harry O.....837 Edmondson avenue.
Morton, Dudley J.....2724 North Charles street.
Muehlberger, George C .....942 North Gay street.
Muller, Walter G.....2326 Fairmount avenue.
Reed, Louis F.....226 North Poppleton street.
Reynolds, Henry C.....1715 Druid Hill avenue.
Ridgely, Nevelle R.....Warren, Baltimore county.
Schammel, William F., Jr.....2230 Bank street.
Schroeter, Henry.....2502 Woodbrook avenue.
Shryock, G. Forney.....821 West North avenue.
Smith, Edward J.....2829 Hudson street.
Voneiff, Craft W.....600 North Gilmor street.
Wimbrough, John D.....3181 Hanover street.
Whitcraft, Lewis N.....1302 West Lexington street.

EIGHTH GRADE—THIRD SECTION.

Aiken, Herbert C. J.....2304 North Calvert street.
Aydelott, William B.....334 East Twenty-first street.
Baldwin, Joseph A.....1524 Druid Hill avenue.
Cautley, John B.....311 West Lanvale street.
Davidson, Frederick.....1406 Harford avenue.
Eisenreich, Joseph H.....16 South Washington street.
Fitzgerald, Percy.....1414 Bolton street.
Goode, William F.....2006 Eutaw Place.
Green, Henry Z.....510 Madison street.
Haylick, Thomas.....1417 North Charles street.
Hays, Donald S.....1620 North Calvert street.
Hemelt, Anthony H.....403 South Washington street.

Hess, John S.....1603 East North avenue.
Hogendorf, Raymond.....2116 Bolton avenue.
Koch, William.....1530 Hollins street.
Lehman, Jesse B.....631 North Bond street.
Leisenring, John G. M.....406 North Greene street.
Linthicum, Clarence A.....1633 East North avenue.
Michael, William N.....1028 Edmondson avenue.
Moore, James J.....391 North High street.
Mordecai, D. Harry.....Stevenson P. O., Baltimore county, Md.
Moulton, J. Frank.....1507 Edmondson avenue.
Mueller, Jacob, Jr.....1617 North Wolfe street.
Mulligan, John T.....1011 Eastern avenue.
Neudecker, Leonard H.....634 Euclid avenue.
Rhodes, Edward O.....1417 Eutaw Place.
Rohrbaugh, Emory G.....1110 Barclay street.
Samuel, William S.....1342 Druid Hill avenue.
Schultz, Arthur.....1102 Myrtle avenue.
Schultz, Leonard L.....1708 Harford avenue.
Shields, William H.....1041 West Fayette street.
Simpson, Milton.....1923 Eutaw Place.
Steffens, Edwin A.....234 South Ann street.
Sullivan, Robert W.....115 Montford avenue.
Swayne, John.....824 Canton street.
Toomey, Harry N.....1525 Battery avenue.
Weil, L. Walker.....305 West Presstman street.
Welch, Randolph M.....1155 North Carrollton avenue.

EVENING CLASSES.

The school term for the evening classes begins the first Monday in October. The classes meet Monday, Tuesday, Wednesday, Thursday and Friday evenings from 7.45 to 9.30 P.M. Books and necessary material are furnished free, and there is no charge for tuition.

COURSE OF STUDY.

These courses of study are for the benefit of those who have failed to receive an education and who now realize the material aid an education would give them in securing promotion; and likewise for those boys and young men who are employed during the day and desire to continue their studies to fit themselves for higher positions.

The students who have availed themselves of the privilege of attending these courses are daily engaged as masons, machinists, firemen, agents, clerks, apprentices, office boys, etc., and many of them speak enthusiastically of the benefit they have already derived from the instruction received.

Students attending these courses can select the studies they wish to pursue, though they are advised not to attempt too many at first.

Instruction is given in Arithmetic, Penmanship, Spelling, Reading, Drawing, Carpentry, Wood-turning, Book-keeping, Stenography, Algebra, Geometry and Electricity.

The courses in these subjects are similar to those pursued in the day school, and are taught by the same teachers and by practical draughtsmen.

The manner of instruction is somewhat different; the teacher is able to devote more time to individual instruction; consequently, the bright, active and regular scholars advance rapidly, while the others are not hurried over what they have failed to understand, but are given more time and special instruction.

The classes in Stenography, Elementary Arithmetic, Grammar, Reading and Spelling, which studies are not taught in the day school, receive the same careful attention.

Munson's System of Phonography is taught by an experienced stenographer and competent teacher. The course consists of a study of the theory and practice of Shorthand, Punctuation, Rapid Dictation, Transcript of Stenographic Notes, Reporting and Speeding.

MECHANICAL DRAWING.

FIRST YEAR.

Geometrical problems and orthographic projections.
Sketches and drawings of machine details.

SECOND YEAR.

Projection and intersections of solids and development of surfaces.
Projection of screws, belts, pulleys, gears and gearing.

THIRD YEAR.

Comprising a complete set of sketches with detail drawings and general plan of machine, made from a model by measurement.

ARCHITECTURAL DRAWING.

FIRST YEAR.

Geometrical problems, plane and solid.
Mouldings and timber joints.
Details of construction, sections, etc.

SECOND YEAR.

Structural details, with sections in wood and stone.
Construction of stairs, trusses, arches, etc.
Plans, elevations and sections of houses.

THIRD YEAR.

Orders of architecture and ornament.
A complete set of plans, elevations and sections of a building from an original design.

FREEHAND DRAWING.

FIRST YEAR.

Study of geometrical forms, plane and solid.
Elementary drawing in outline of ornaments and objects from blackboard and models.
Elementary designing and perspective.

SECOND YEAR.

Drawing of groups of geometric solids, ornaments and objects from models.
Shading in charcoal and crayon.
Perspective.

THIRD YEAR.

Study of light and shade from model and cast.
Still-life composition.
Designing.

BOOK-KEEPING.

The course in book-keeping is designed to cover two years, and furnish a complete knowledge of double entry book-keeping, counting-room practice and commercial arithmetic.

Students will be divided into three classes, viz.: Entrance, Intermediate and Graduating; all new pupils will be assigned to the first, from which they will be promoted to the second when their fitness is demonstrated to the teacher. Qualified students will be advanced from the second to the third at the end of the first year, or at any time during the year that they may give evidence of proper ability to take up the work of the third class.

A certificate of proficiency will be awarded as the result of an examination at the end of the second-year course.

STENOGRAPHY.

FIRST YEAR.

Table of Consonants.
Vowel-scale.
Table of Diphthongs.
Ess and Zee Circle.

Method of writing circles between two consonant stems.
The Large Circle.
Hooks—St, Zd and Str.
The Small Circle added to St. and Str.
Rules for use of Ish, Shee, El, Lee, Er, Ree.
Initial Hooks—El and Er.
Special Vocalization.
The Way Hook.
The Yay Hook.
Final Hooks—Ef, Vee, En, Shun, Ter, Thr or Dhr.
Circles and loops added to final hooks.
Lengthening.
Positions of double-length consonants.
Halving.
Positions of half-length consonants.

SECOND YEAR.

Rules for Ly, Ry, Ty, In or Un, Ture.
Rules for Past Tense.
Omission of Vowels.
List of Word Signs.
Prefixes—Com, Con, Cog.
For.
Magna, Magni, Magne.
Self.
Un.
With.
Suffixes—Ble, Bly.
Bleness, Fulness, Iveness, Lessness.
Ever.
For.
Ing.
Mental, Mentality.
Ology.
Self.
Selves.
Ship.
Soever.
Worthy.
Omission of certain Consonants.
Omission of certain Hooks.

THIRD YEAR.

PHRASEOGRAPHY.

Rules for—As, has, is, his or us.
To, it, the.
There, their or they are.
All or will.
Are, our or or.
We.
You or your.
In.
Have or of.
And, an, own, been or than.
There, their, they are or other.
The, it, had or to.
After.
Another.
Its.
Not.
Position of phrase-signe, etc.
Ticks—I, an, a, and.
The, he.
Joining Ticks to Circles.
Omission—Of, to, too.
Type-writing.